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ABSTRACT

This curriculum guide, keyed to the building maintenance competency profile developed by industry and education professionals, provides three units on carpentry and finishing procedures. The first unit, Exterior Carpentry, contains the following lessons: carpentry safety procedures, ladder and scaffolding safety, door installation/repair, door-operating hardware, window installation/repair, window cleaning, exterior siding, repairing exterior trim, repairing roof flashing, repair/replace roof shingles, replacing downspouts and guttering, and installing weatherproofing. Unit 2, Interior Carpentry, covers the following topics: interior finishing, repair/replace interior wall paneling, floor covering, ceiling systems, insulation, interior finishing, install or replace ceramic tile, wall framing, and clean and finish floors and walls. Unit 3, Finishing Procedures, includes four lessons: safety; prepare surface for finish; select correct finishing materials; and prepare, apply, and store finishing materials. Each lesson includes some or all of the following color-coded components: performance objectives, information sheets, transparency masters, handouts, assignment sheets, job sheets, lesson tests, and answer key. (YLB)

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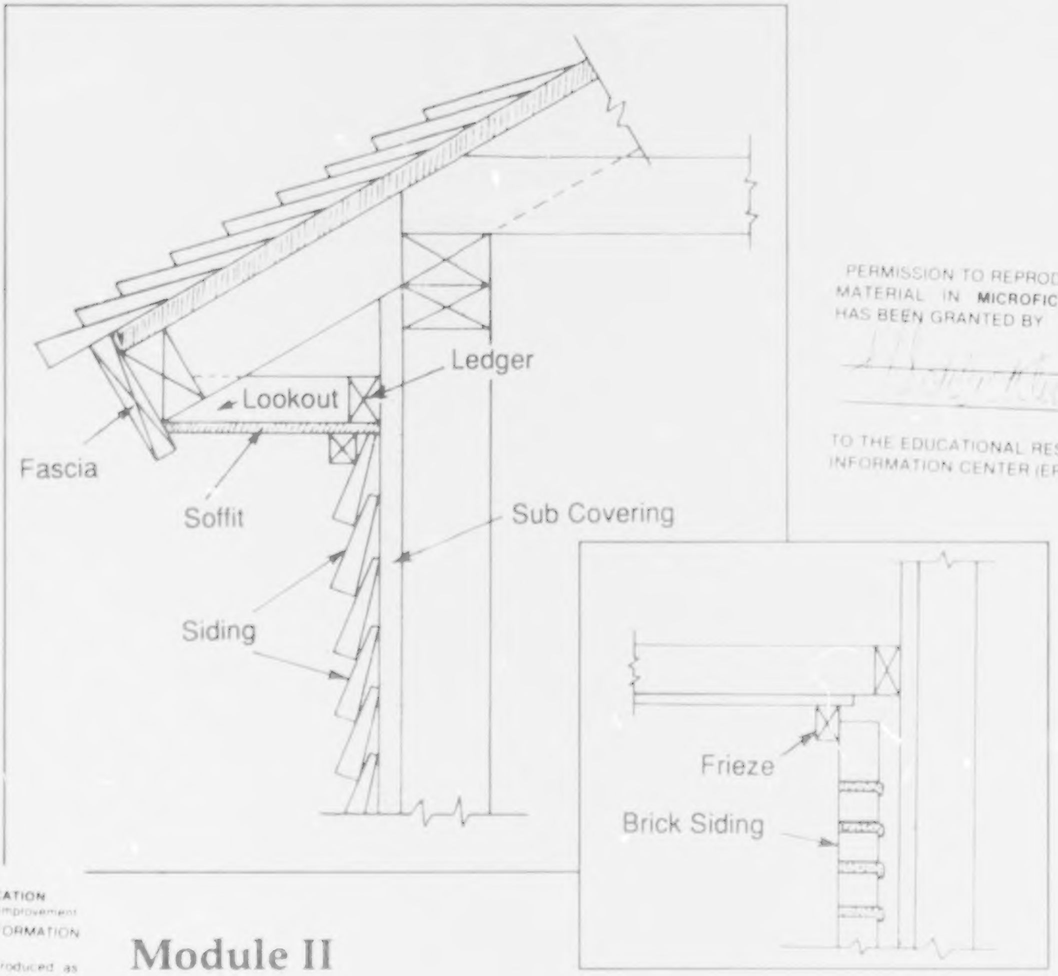
Instructor's Guide



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Module II

Carpentry and Finishing Procedures

CE056280

BUILDING MAINTENANCE

Produced by Instructional Materials Laboratory
In cooperation with the Department of Elementary
And Secondary Education

Modules in this IML Building Maintenance series:

Orientation to Building Maintenance

Carpentry and Finishing Procedures

Plumbing Procedures

Electrical Procedures and Environmental Control Systems

Masonry Procedures

Grounds Maintenance Equipment and Procedures

The activity which is the subject of this report was supported in whole or in part by funds from the Department of Elementary and Secondary Education, Division of Vocational and Adult Education. However, the opinions expressed herein do not necessarily reflect the position or policies of the Missouri Department of Elementary and Secondary Education or the Division of Vocational and Adult Education, and no official endorsement should be inferred.

BUILDING MAINTENANCE

Module II: Carpentry and Finishing Procedures

prepared by

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Produced by the Instructional Materials Laboratory
10 London Hall
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Columbia, MO 65211
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March 1990

Instructor's Guide
Catalog Number 70-2302-I

FOREWORD

We are indebted to the teachers and administrators who have provided their time, efforts and professionalism to the development of this guide. This guide is an outstanding example of what can be accomplished when the right people with the right attitude get together. The curriculum writers and subject matter experts who worked on this guide are to be commended for a job well done.

The Vocational Instructional Management System (VIMS) has become Missouri's framework for competency-based instruction; therefore, the Building Maintenance Curriculum Guide is designed to be totally integrated with the VIMS system. A curriculum guide is more than a resource--it is an integral part of the management system. Its purpose is to guide and facilitate competency-based instruction to help classroom teachers manage instruction.

The format of this guide has been set up for competency-based teaching and testing. Unit tests evaluate specific competencies and can be used with the Vocational Administrative Management System (VAMS). All information sheets, transparency masters, job sheets, assignment sheets and test items are keyed to specific competencies. A cross reference table has been included to quickly identify parts of the curriculum that relate to specific competencies. The material has also been packaged for students.

Competencies are stated prior to instruction and the student knows what the basis for evaluation will be. Each student is thus held responsible for mastering the competencies. The basis for grading is attainment of competencies rather than measurement against other students.

Although this guide may be a new format and new system for many teachers, we are confident that, when used as designed, time spent by teachers and students will become more productive. Any future building maintenance curriculum modifications will begin with this guide. We will evaluate the need to update this guide on a module-by-module basis. Your suggestions regarding areas for improvement are both encouraged and appreciated.

Judith Moore, Supervisor
Industrial Education
Department of Elementary and Secondary Education

Chuck Waibel, Director
Industrial Education
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ACKNOWLEDGEMENTS

This building maintenance guide represents a continuing commitment to Missouri's Vocational Instructional Management System (VIMS). The guide has been keyed to the building maintenance competency profile developed by industry and education professionals in the state.

When searching for current building maintenance materials to adopt or utilize in the guide's development, comparable materials were found from the Occupational Curriculum Laboratory of East Texas State University and the Curriculum and Instructional Materials Center of Stillwater, Oklahoma. These materials have been utilized as a resource for this guide. A debt of thanks is owed to the Occupational Curriculum Laboratory and the Curriculum and Instructional Materials Center for the research and development of these building maintenance materials.

These educators contributed to the guide as members of the advisory and fieldtest committees:

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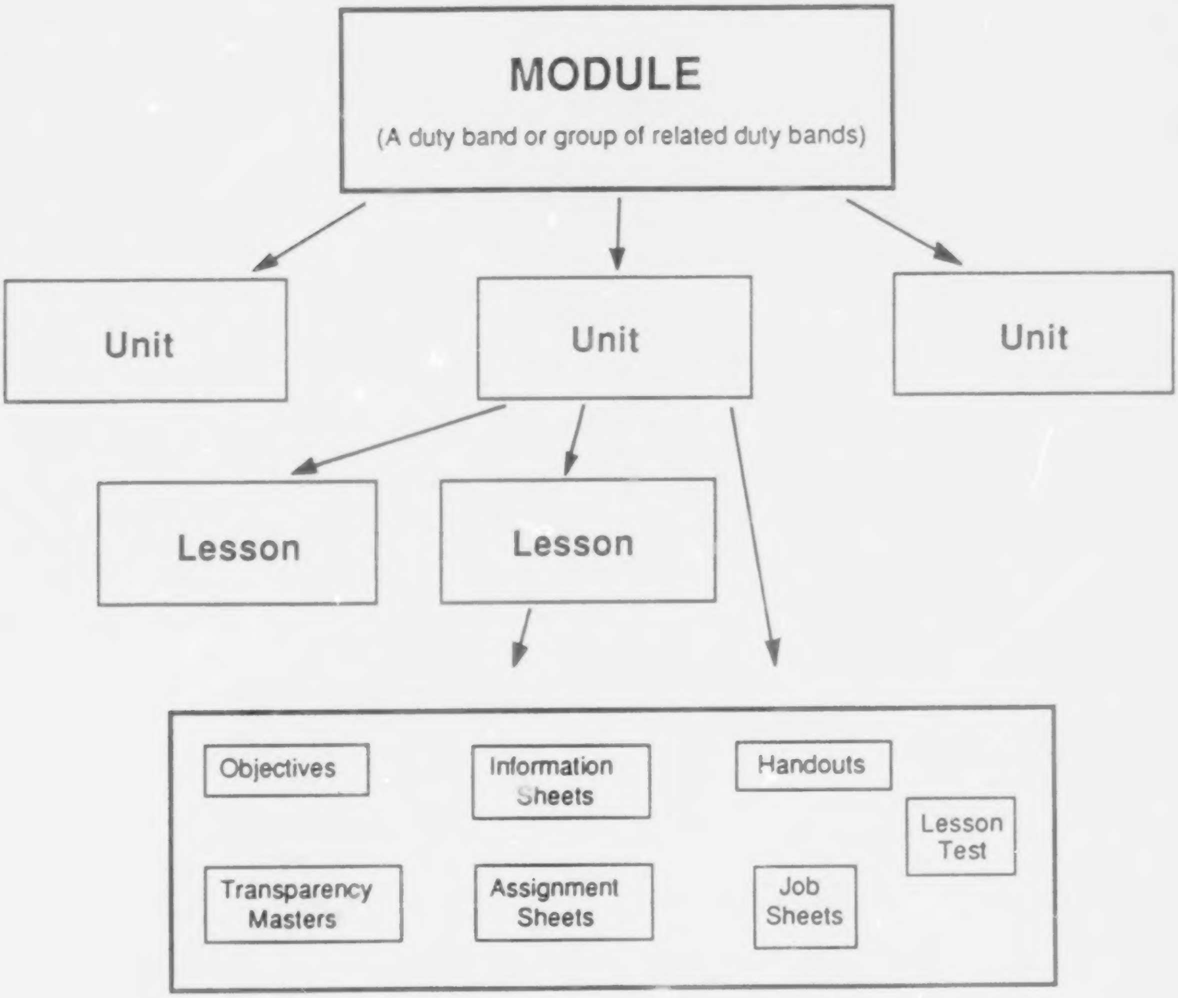
HOW TO USE THIS PUBLICATION

GUIDE COMPONENTS

Units of Instruction

This Building Maintenance guide contains six modules of instruction. Within each module are instructional units including some or all of the following components: performance objectives, information sheets, transparency masters, handouts, assignment sheets, job sheets and lesson tests.


MODULE
(A duty band or group of related duty bands)
Unit
Unit
Unit
Lesson
Lesson
Objectives
Information Sheets
Handouts
Lesson Test
Transparency Masters
Assignment Sheets
Job Sheets

Competency profile

On the Missouri competency profile, tasks are divided into general subject areas, or duty bands, which are identified by a capital letter. Under each duty are related tasks (competencies), which are identified by an Arabic numeral. To evaluate the student's performance of the competencies, a 3-2-1-N grading system is used where:

3 = **Mastery**--can work independently with no supervision
2 = **Requires supervision**--can perform job completely with limited supervision
1 = **Not mastered**--requires further instruction and close supervision
N = **No exposure**--no experience or knowledge in this area

Cross-reference table (color-coded white)

Once the numbering system is understood, this table quickly reveals how the instructional components of the module relate to Missouri competencies. On the competency profile, tasks are divided into general subject areas, or duty bands, which are identified by a capital letter. Under each duty band are related tasks (competencies), which are identified by an Arabic numeral.

On the cross-reference table, unit numbers are represented by Roman numerals (I, II, III, etc). Other components of the module (transparencies, handouts, assignment sheets and job sheets) are shown with Arabic numerals. By looking at the cross-reference table, the instructor can quickly determine what test questions or job sheets a student needs to receive an evaluation for on a particular competency.

Objectives (color-coded white)

Each unit is based on performance objectives which state the measurable unit and specific behavioral or performance objectives that students are expected to achieve. Since the objectives of the unit provide direction for the teaching-learning process, it is important for the teacher and students to have a common understanding of the objectives and how they are intended to be used. Teachers should feel free to add/adapt objectives which will fit the material to student and community needs. Supporting material will, of course, need to be added for any new objectives.

Table of contents, references (color-coded white)

These pages have been coded pink for instructor use only. The reference section lists materials used as sources in developing the material.

Information sheets (green)

Presented in outline form for clarity, these pages provide content essential for meeting the cognitive (knowledge) objectives in the unit. Students should study the information sheets before class discussion or completion of assignment sheets.

Transparency masters (white)

Transparencies provide information by visually reinforcing or clarifying ideas presented in the information sheets. They are effective when identification is necessary and when they direct the student's attention to the topic of discussion. Transparencies should be left on the screen only when topics shown are under discussion.

Handouts (white)

Whenever more detailed information than can be presented in a transparency is needed, a handout is used. Handouts give the students additional information that can be kept with their class notes or student references.

Assignment sheets (tan)

Assignment sheets furnish paper-and-pencil practice to develop the knowledge necessary as a prerequisite to skill development. They can be given to students for class completion or used as homework assignments. Answer sheets (color-coded pink) can be used by the student or instructor to check progress.

Job sheets (blue)

These evaluation instruments are provided for two purposes: to outline steps of procedure and to check student performance mastery. Job sheets begin with a list of tools and materials needed for the activity. Job sheets furnish potential employers with a picture of skills being taught and performance which might be reasonably expected from a vocational student. The spaces to the right of the page on a job sheet assist the instructor in evaluating a student on a particular activity. This 3-2-1-N grading system is the same as the one used on the competency profile.

Lesson test (yellow)

Competency-based tests are designed to help eliminate subjective testing and to improve student evaluation and accountability. Specific competencies and test questions are linked on the answer key. These lesson tests have been written to be used with computerized VAMS (Vocational Administrative Management System), utilizing Scantron sheets for computer-recording of test answers.

The lesson test may be eliminated if the competency was thoroughly evaluated by job sheets. However, an emphasis should be placed on cognitive as well as performance skills. If the objective or competency will be evaluated by a job sheet, it is often necessary to determine by a written test whether the student understands enough of the material to perform the job sheet.

SUGGESTED ACTIVITIES

The following list of suggested activities may be helpful.

1. Provide students with objective sheet and information sheets.
2. Discus specific objectives.
3. Discuss information sheets, assignment sheets and/or job sheets, lesson-by-lesson.
4. Have students do assignment sheet(s) to satisfactory levels.
5. Give students lesson test.
6. After successful completion of the test, have students do job sheet(s).

Students should perform the following activities.

1. Read objective sheet.
2. Study information sheets.
3. Do assignment sheet(s).
4. Take lesson test.
5. Do job sheets.

PACKAGING

This Building Maintenance guide has been packaged with an entire class in mind. For the teacher, a complete instructor's guide contains all six modules. In the student reference, selected portions have been reproduced for student use (objectives, information sheets, handouts). Student work sheets (assignment sheets, job sheets, lesson tests) have been packaged together for student distribution as the instructor deems necessary.

In the student reference, page numbers do not run consecutively because some pages have been removed that appear only in the instructor's guide.

Building Maintenance

Module: Carpentry & Finishing Procedures

Cross-Reference Table of Instructional Materials

Competency	Unit	Instructional Objective	Transparency Master	Handout	Assignment Sheet	Job Sheet	Test Item	Notes
B-1	I	1.1-1.4			1		1-25	
B-2	I	2.1-2.2	1-3				1-10	
B-3	I	2.1-2.2	1-3					
B-4	I	3.1-3.4	1			1	1-34	
B-5	I	4.1-4.4	1-4		1	1	1-11	
B-6	I	5.1-5.3	[illegible]			2	1-16	
B-7	I	6.1-6.2	[illegible]			2		
B-8	I	7.1-7.3	2				1-26	
B-9	I	8.1-8.2	1-3		1	1	1-21	
B-10	I	9.1-9.3	1				1-8	
B-11	I	10.1-10.4	1-7	2	2		1-36	
B-12	I	11.1-11.4	1	1		1	1-21	
B-13	I	12-1-12.3				1		
E-1	I	1.1-1.4			1		1-25	
E-2	II	1.1-1.3	1-3			2	1-2	
E-3	II	2.1-2.4	1			1	1-4	
E-4	I	4.1-4.4	1-4		1	1	1-11	
E-5	II	3.1-3.2					1-5	

Competency	Unit	Instructional Objective	Transparency Master	Handout	Assignment Sheet	Job Sheet	Test Item	Notes
E-6	II	4.1-4.3	2			1	1-8	
E-7	II II	5.1-5.4 8.1-8.8	1-6			1 2	1-20 1-26	
E-8	II	6.1-6.6	2			1-4	1-11	
E-9	II	7.1-7.4	2				1-20	
E-10	II	2.1-2.4	1			1	1-4	
E-11	II	9.1-9.2				2		
E-12	II	9.1-9.2				2		
F-1	III	1.1-1.10	1-8		1		1-52	
F-2	III	2.1-2.2				1	1-6	
F-3	III	3.1-3.4						
F-4	III	4.1-4.5						
F-5	III	4.1-4.5						
F-6	III	4.1-4.5						
F-7	III	4.1-4.5						
F-8	III	4.1-4.5				1-3		

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 1: CARPENTRY SAFETY PROCEDURES

LESSON OBJECTIVE

After completion of this lesson, the student should be able to IDENTIFY GENERAL SAFETY RULES FOR WORKING WITH CARPENTRY TOOLS AND EQUIPMENT. Mastery will be evidenced by satisfactorily completing assignment sheets and by scoring __________ percent on the lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Identify unsafe work situations in carpentry.
2. Identify general safety rules in the shop.
3. Identify safety rules for clothing worn in the shop.
4. Identify safety rules for using tools.

Completion of the requirements of this lesson fulfills competency B-1 and E-1 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 1: CARPENTRY SAFETY PROCEDURES

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Assignment sheet
   1. Identify possible dangers

D. Answers to assignment sheet

E. Lesson test

F. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 1: CARPENTRY SAFETY PROCEDURES

INFORMATION OUTLINE

I. Develop a safety attitude

   A. Report all accidents to your instructor

   B. The carpentry shop is no place to play--sharp corners, hard surfaces and sharp tools can lead to injury

   C. Always clean your work area

   D. Always be willing to help others--teamwork makes jobs easier and safer

   E. Read all safety rules, posters and notices before operating any machine

   F. Operate power tools and equipment only after getting approval of the instructor

   G. Inspect all equipment for proper working order

   H. Avoid careless mistakes--most accidents can be traced to human error rather than equipment failure

II. Wear safe and protective clothing

   A. Wear clothing that cannot be caught in tools or equipment and cause injury

   B. Wear proper safety clothing and eye protection at all times

   C. Never wear jewelry when operating power tools or machines

III. Use carpentry tools safely

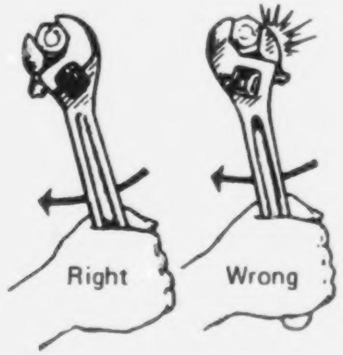
   A. Always use the right tool for the right job

   B. Keep all tools in good working order--a dull tool will not work properly and can cause an accident

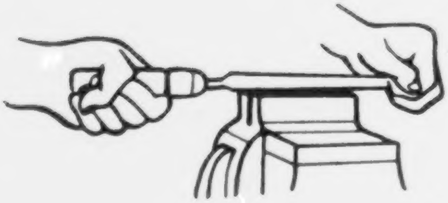
IV. Hand tool safety and care

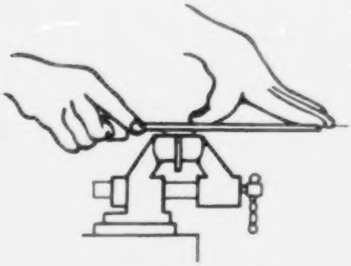
A. Use tools correctly

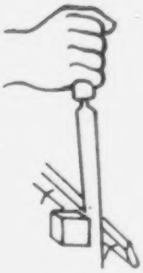
1. Wrenches



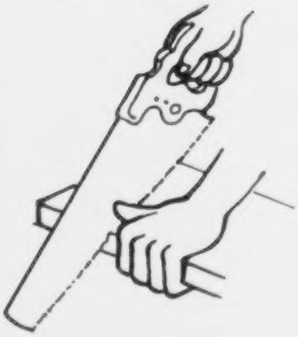
2. Files

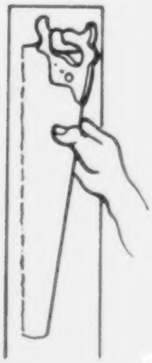

Use a handle

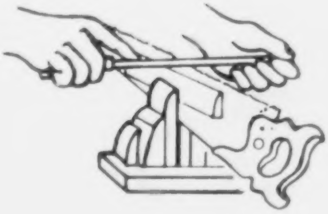

Hold Properly


Don't Pry

3. Saws

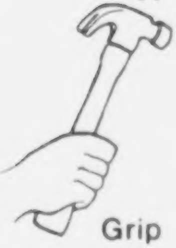

Start This Way


Hang it up

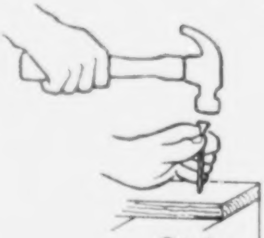

Keep it Sharp

CFP 6

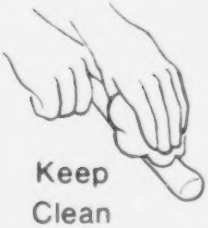
4. Hammers



Grip Well

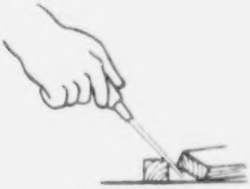


Strike Squarely

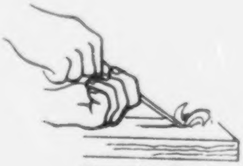


Keep Clean

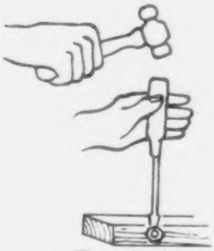
5. Screwdrivers



Don't Pry

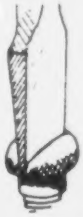


Don't Chisel

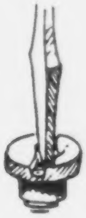


Don't Hammer

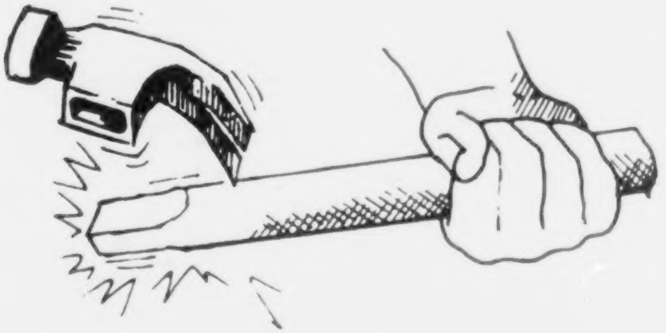
B. Keep tools working properly
1. A correct screwdriver fit



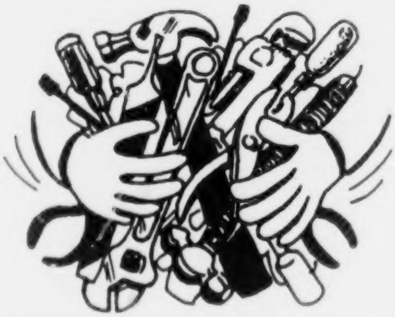
2. A poor fit damages the screwdriver and screw slot



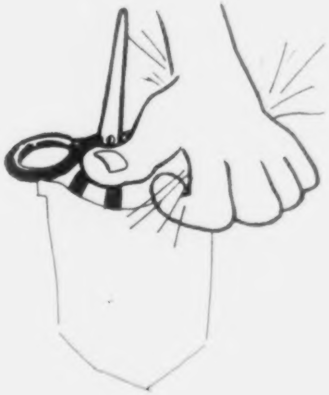
3. Check hammer heads before use



C. Do not carry more tools than you can handle

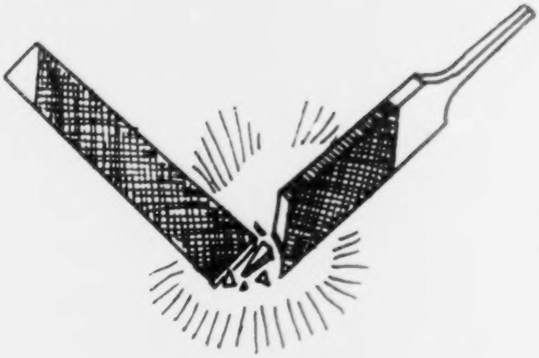


D. Carrying sharp tools in your pocket can injure you or someone else

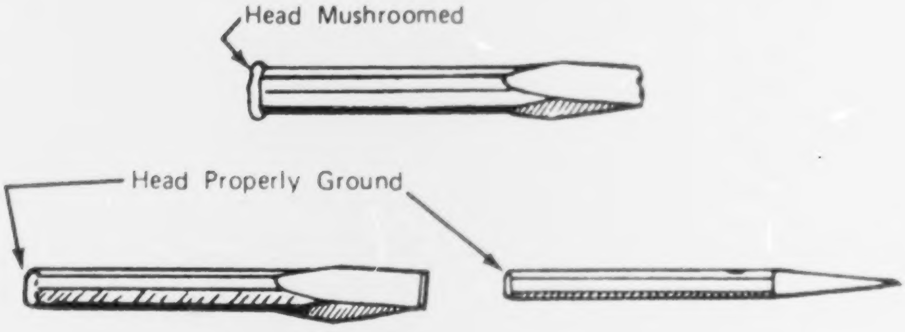


CFP 8

E. Do not drop tools



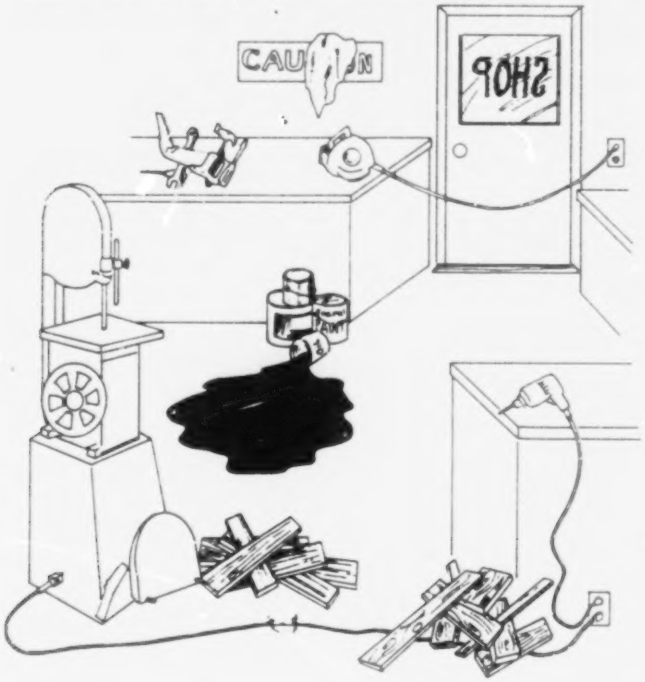
F. Keep sharpened tools sharp


Head Mushroomed
Head Properly Ground

AS 1

IDENTIFY POSSIBLE DANGERS

Directions: List each of the possible dangers that can be identified in the drawing below. Tell what can be done to avoid an accident.



1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

Satisfactory completion of this assignment sheet is student's partial fulfillment of Competency B-1 of Building Maintenance.

ANSWERS TO ASSIGNMENT SHEET 1

Answers may appear in any order:

1. Power saw on edge of table with the cord stretched across walkway
2. Wood lying across extension cord
3. Tools piled on table
4. Frayed cord
5. Spilled oil
6. Piles of scrap lumber around wood-working equipment
7. Rag hung over caution sign
8. Nails in board
9. Loose blades or parts of equipment
10. Guards leaning against equipment with belts showing

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 1: CARPENTRY SAFETY PROCEDURES

LESSON TEST

Part 1. Choose the correct general safety rules to follow by circling the letter of the phrase that best completes each statement below.

1. The best thing to develop when working around equipment is:

   A. a set of strong muscles

   B. a humorous personality

   C. a safety attitude

2. Most accidents are a result of:

   A. human error

   B. equipment failure

   C. being overworked

3. Machines should be operated when:

   A. you are told to do so by your instructor

   B. you find the "ON" switch

   C. you think you can operate the machine

4. Proper safety clothing includes:

   A. rings, jewelry and gloves

   B. safety glasses, protective equipment and proper clothing for the work

   C. a suit of armor

5. Equipment should be inspected for proper working order:

   A. while in use

   B. before using

   C. every other week

6. The danger involved in wearing shirts with long sleeves or gloves is that:

   A. they are hot and uncomfortable

   B. they are unattractive

   C. they can get caught in moving parts

7. Make adjustments on equipment:

   A. with the switch on and the machine running

   B. with the machine stopped and power on

   C. with the machine stopped and power off

8. Tools should be kept:

   A. picked up and properly stored

   B. on the machines for easy use

   C. in your pockets

9. Accidents should be reported:

   A. only if they are severe

   B. even if they seem minor

   C. only when blood appears

10. The work area should be kept:

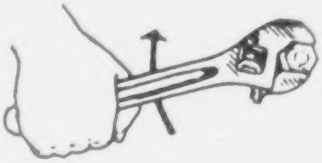
   A. clean and organized

   B. messy so it appears work has been done

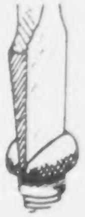
   C. waxed and polished

Part 2. Place a "T" in the blank by each picture that shows a proper, safe use of hand tools and an "F" by each picture that shows an incorrect, unsafe use.

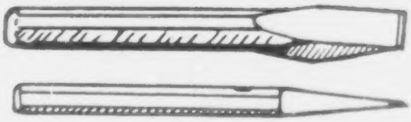
_____11. The correct use of an adjustable wrench is



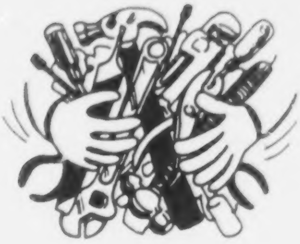
_____12. The correct use of a screwdriver is



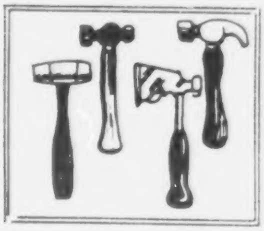
_____13. A properly sharpened tool should be



_____14. Tools should be carried



_____15. Tools should be stored



CFP 17

Part 3. Place a "T" by each correct statement of a carpentry safety rule and an "F" by incorrect statements.

______16. Only major shop accidents should be reported

______17. You can play in the carpentry shop when you don't have anything to do

______18. You should never wear loose clothing in the shop

______19. You must seek approval from your instructor before operating any power tool or equipment

______20. It is a good safety habit to clean your work area

______21. Wearing rings or other jewelry is dangerous in the carpentry shop

______22. It is advisable to read all the safety posters and notices before you operate any machine

______23. A sharp tool is a safe tool if used correctly

______24. To work safely, you must use the right tool for the right job

______25. Pointed tools can be safely carried in your pocket

MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT I, LESSON 1 TEST

Part 1.

1. c
2. a
3. a
4. b
5. b
6. c
7. c
8. a
9. b
10. a

Part 2.

11. F
12. T
13. T
14. F
15. T

Part 3.

16. F
17. F
18. T
19. T
20. T
21. T
22. T
23. T
24. T
25. F

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 2: LADDER AND SCAFFOLDING SAFETY

LESSON OBJECTIVE

After completion of this lesson, the student should be able to IDENTIFY CORRECT SAFETY RULES ASSOCIATED WITH CARRYING AND ERECTING A LADDER AND ERECTING SCAFFOLDING. Mastery will be evidenced by scoring _____ percent on the lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will

1. Identify safety rules associated with carrying and setting up a ladder.
2. Identify safety rules associated with setting up scaffolding.

Completion of the requirements of this lesson fulfills competencies **B-2 and B-3 of Building Maintenance.**

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 2: LADDER AND SCAFFOLDING SAFETY

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Transparency masters
  1. Types of ladders
  2. Types of scaffolds
  3. Freestanding scaffold assembly

D. Lesson test

E. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 2: LADDER AND SCAFFOLDING SAFETY

INFORMATION OUTLINE

I. Scaffold safety

  A. Always set on solid, level ground

  B. Check scaffold framing for proper connections after assembly

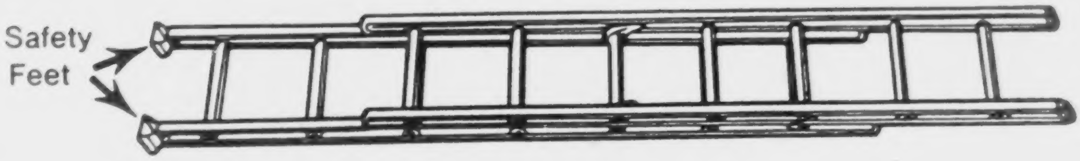
  C. Scaffold should be strong enough to support the load

  D. Anchor properly

  E. Use guardrail to prevent fall

II. Ladder safety

  A. Extension ladders should have safety feet to prevent skidding



  B. Ladders should stand solidly on the ground when in use

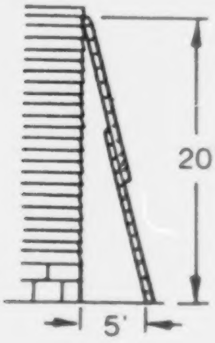
  C. Never overextend your reach when standing on a ladder

  D. Never stand on top rung

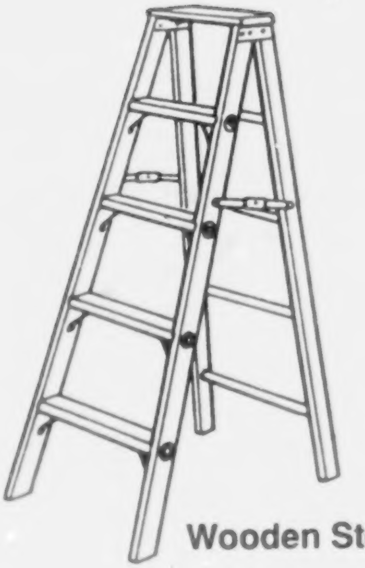
  E. Two persons should set up heavy ladders

  F. Stepladders should have all four legs on solid, level ground

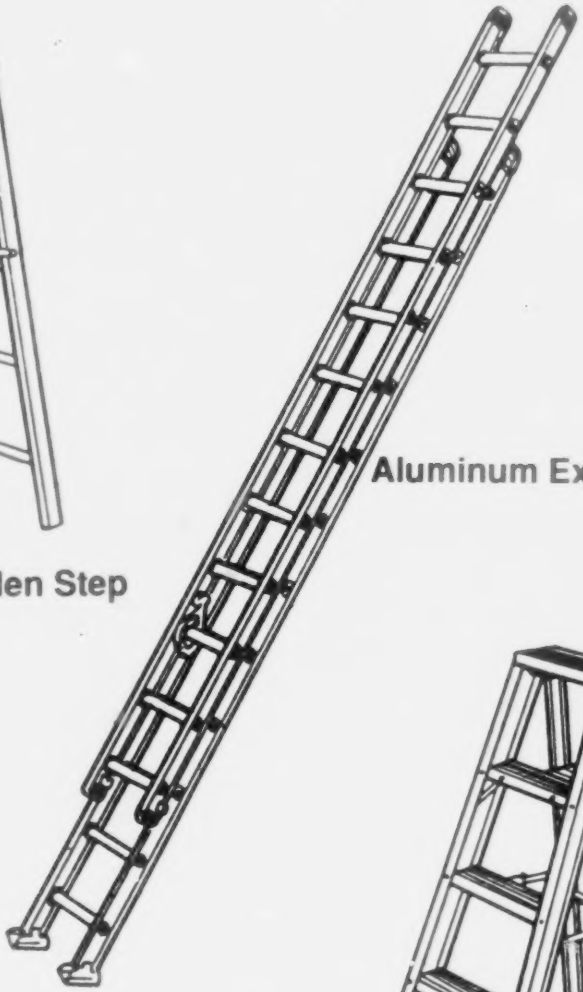
G. Extension ladders should stand with base one-fourth distance of height away from the wall



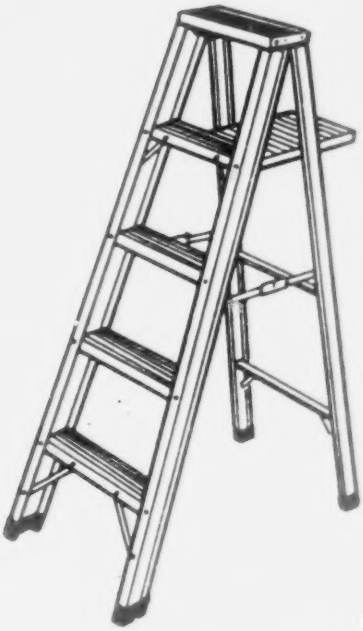
Types of Ladders



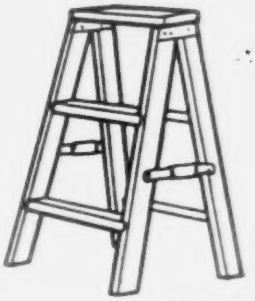
Wooden Step



Aluminum Extension

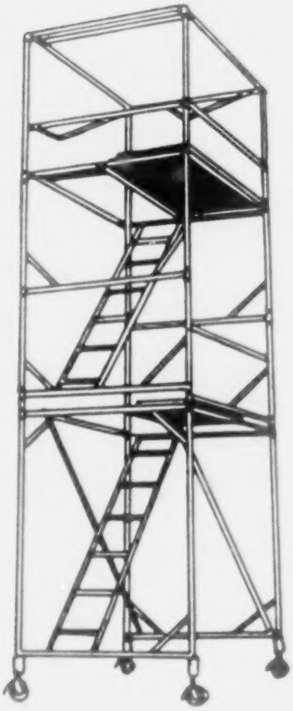


Aluminum

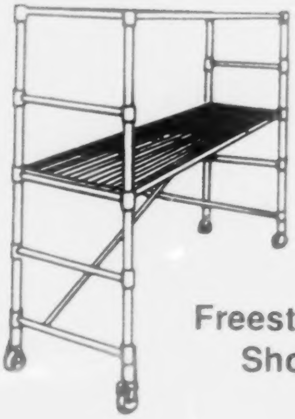


Wooden Step

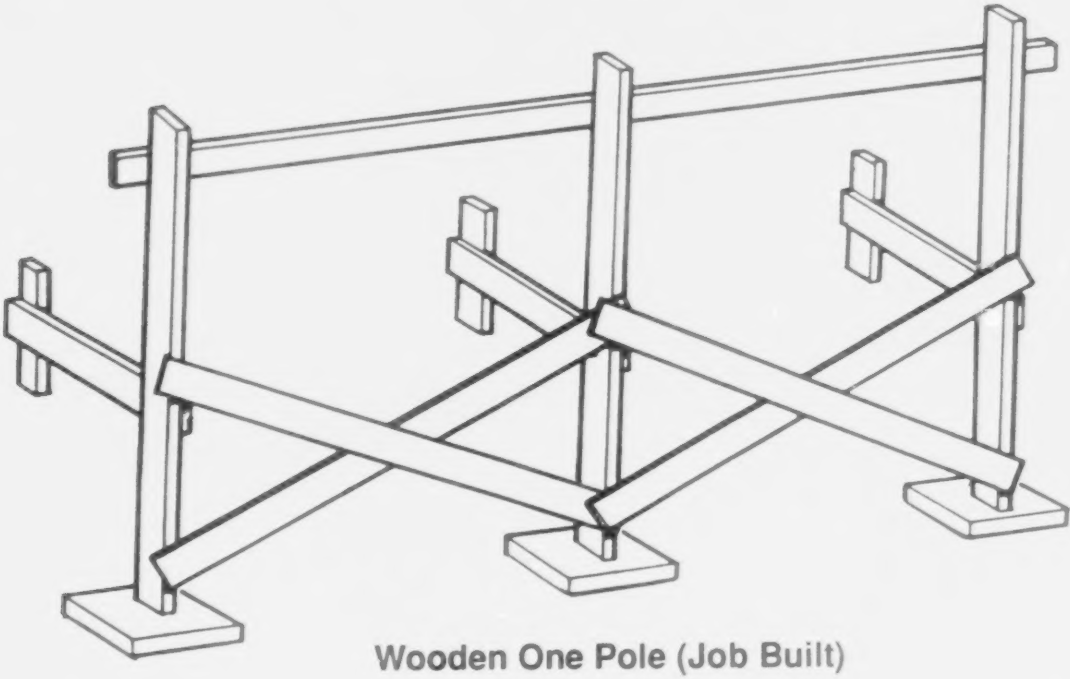
Types of Scaffolds



Freestanding Metal Stairway



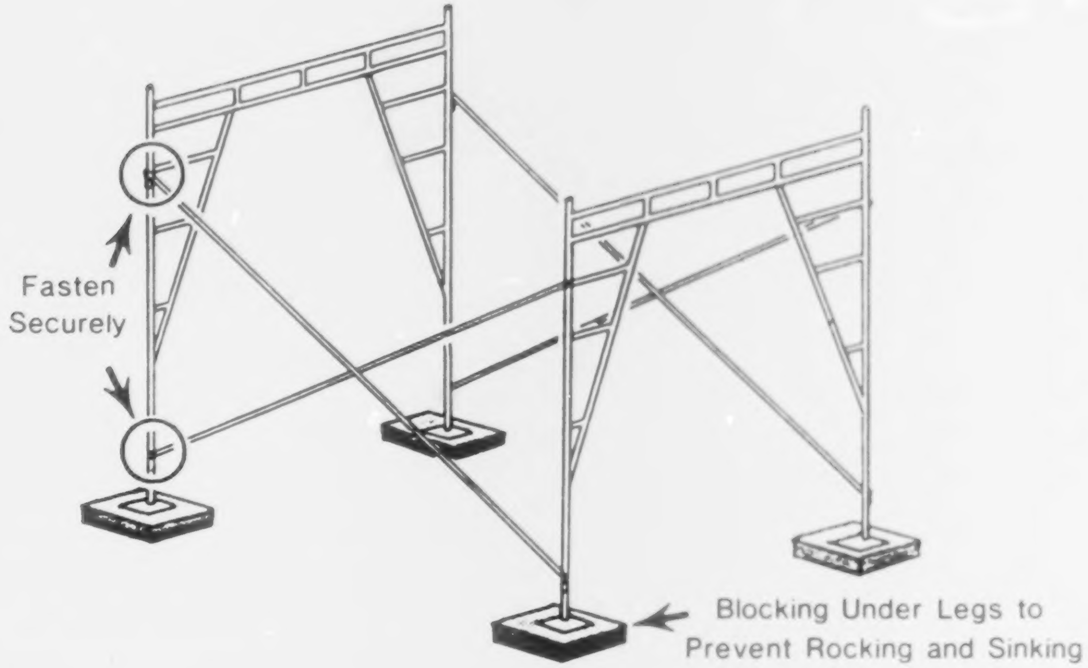
Freestanding Metal Short Span

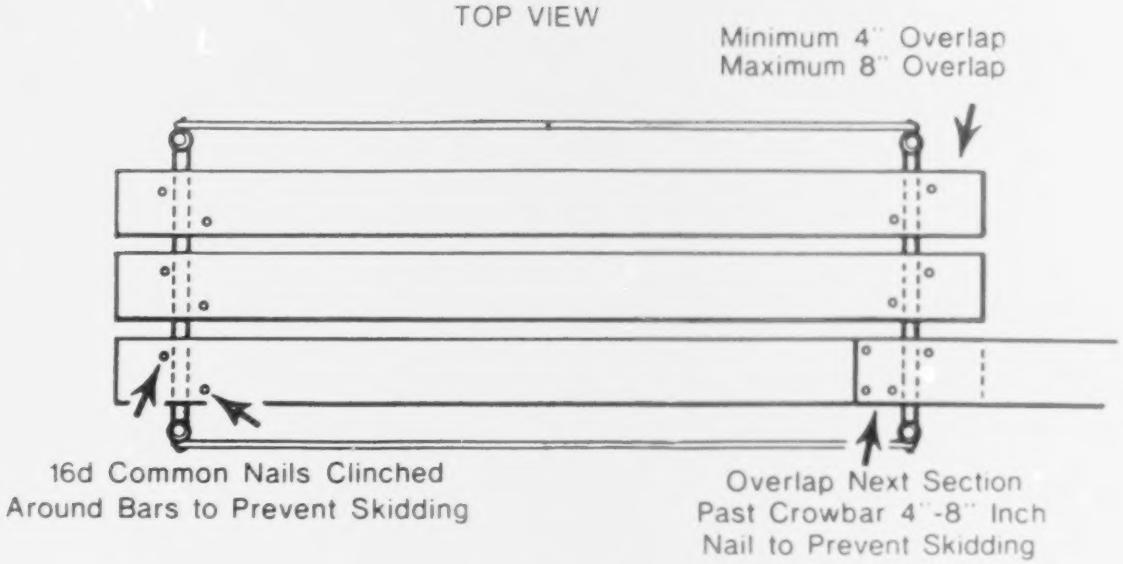


Wooden One Pole (Job Built)

CFP 29

Freestanding Scaffold Assembly


Fasten
Securely
Blocking Under Legs to
Prevent Rocking and Sinking


TOP VIEW
Minimum 4" Overlap
Maximum 8" Overlap
16d Common Nails Clinched
Around Bars to Prevent Skidding
Overlap Next Section
Past Crowbar 4"-8" Inch
Nail to Prevent Skidding

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 2: LADDER AND SCAFFOLDING SAFETY

LESSON TEST

Directions: Place a "T" on the blank beside correct statements about scaffold and ladder safety and an "F" beside incorrect statements.

______ 1. Check scaffold framing connections after assembly

______ 2. Scaffolds should be set on solid, level ground

______ 3. Scaffolds should be strong enough to support the load

______ 4. Guardrails are used to make the scaffold stronger

______ 5. Extension ladders should have safety feet to prevent skidding

______ 6. Stepladders should have at least three legs on the ground

______ 7. Never overextend your reach when standing on a ladder

______ 8. Extension ladders should stand with the base one-fourth distance of height away from the wall

______ 9. Be especially careful when standing on the top rung

______10. Two persons should set up heavy ladders

MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT I, LESSON 2 TEST

1. T
2. T
3. T
4. F
5. T
6. F
7. T
8. T
9. F
10. T

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 3: EXTERIOR DOOR INSTALLATION/REPAIR

LESSON OBJECTIVE

After completion of this lesson, the student will be able to INSTALL A PREHUNG EXTERIOR DOOR AND KNOW THE STEPS FOR INSTALLING A DOOR FRAME IN A BRICK WALL AND A GARAGE DOOR. Mastery will be evidenced by completing a job sheet and scoring__________percent on the lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Identify and define terms and definitions associated with exterior door installation.
2. Install a prehung exterior door.
3. Identify steps to set a door frame in a brick wall.
4. Identify steps in installing a garage door.

Completion of the requirements of this lesson fulfills competency B-4 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 3: EXTERIOR DOOR INSTALLATION/REPAIR

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Transparency master
  1. Plumbing door jambs

D. Job sheet
  1. Installing a prehung door

E. Lesson test

F. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 3: EXTERIOR DOOR INSTALLATION/REPAIR

INFORMATION OUTLINE

I. Terms and definitions

   A. Brick molding--casing that is used around doors

   B. Screens--devices attached to window frames for ventilation and to keep insects out

   C. Jalousies--horizontal glass slats that are held together by a metal frame at each end

   D. Rough opening--opening in which doors are placed

   E. Exterior doors--the outside entrances

   F. Exterior sliding glass doors--outside glass doors that slide to open

   G. Garage doors--exterior door to garage for car

   H. Stiles--vertical members of a panel door

   I. Rails--horizontal members of a panel door

II. Door installation (exterior)

   A. Check door sizes and rough openings

   B. Unpack doors and check for damage

   C. Remove braces on doors

   D. Strip sheathing with black paper

III. Installing a pre-hung exterior door

   A. Adjust the flooring and rough framing members so sill will be correct height

   B. Take finished floor level into account when adjusting for correct height

   C. Place the frame and door in opening

- D. Adjust the amount of space between the side jambs and rough openings
- E. Level door frame with wedge and straightedge
- F. Make sure top of the door and head jamb are parallel
- G. Drive nail through head casing into trimmer studs
- H. Make final check to determine if any adjustment is needed
- I. Nail outside casing to studs with finishing nails
- J. Use nail set for setting of the nails

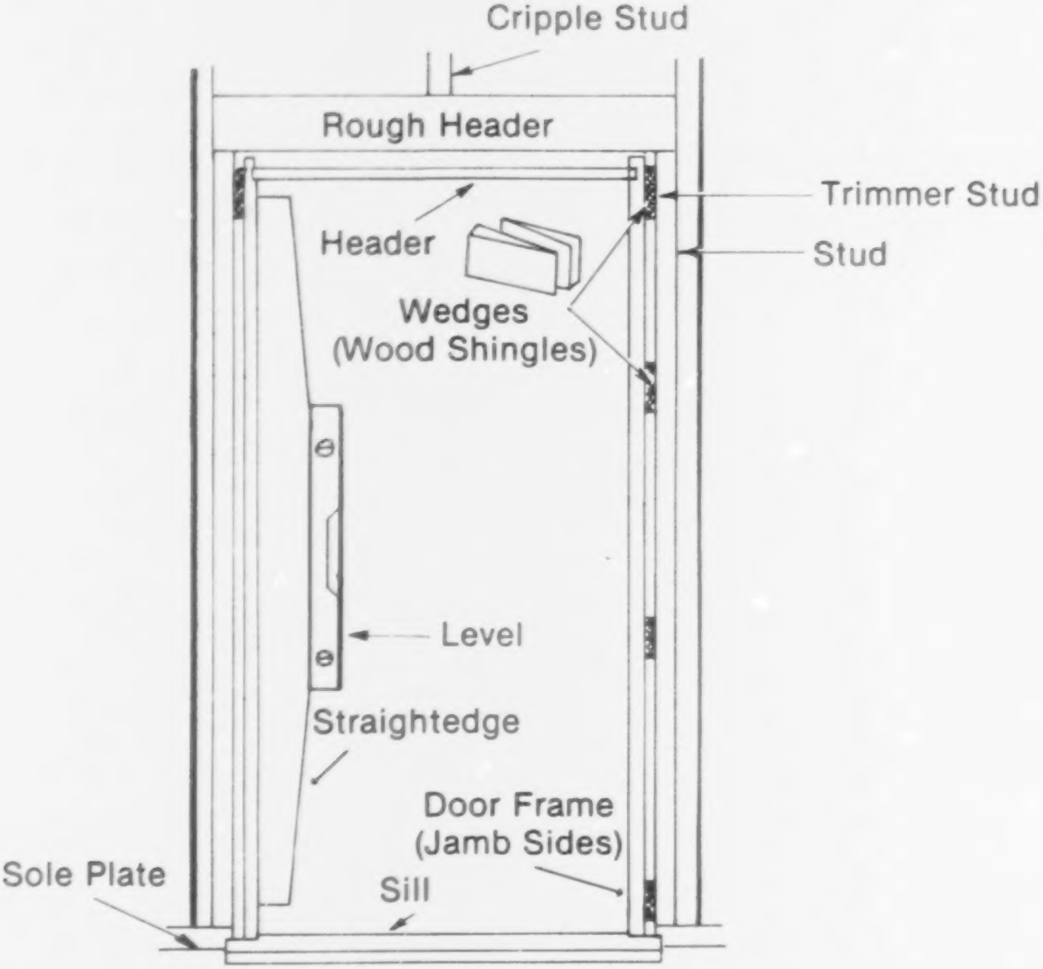
IV. Set a door frame in brick wall

- A. Measure the height of head jamb above finished floor in relation to floor level
- B. Cut spreader to fit over threshold to hold inside jamb
- C. Check the frame to see if it is square
- D. Renail corner braces, if necessary, to make frame perfectly square
- E. Raise frame up into position in correct relationship to the masonry wall and inside finished wall
- F. Nail braces to frame and fasten braces to floor to secure frame in place for bricklayer

V. Install a garage door

- A. Cut material for framing opening for garage door
- B. Plumb and square frame to fit door size
- C. Temporarily tack stops in place
- D. Assemble door sections in opening and attach hinges
- E. Attach roller to door
- F. Place track on roller and attach track to jamb
- G. Adjust opening and closing, if necessary
- H. Reset stops to allow door to open and close smoothly
- I. Install locks

Plumbing Door Jambs


Cripple Stud
Rough Header
Trimmer Stud
Header
Stud
Wedges
(Wood Shingles)
Level
Straightedge
Door Frame
(Jamb Sides)
Sole Plate
Sill

Plumbing Door Jambs

INSTALLING A PREHUNG DOOR

Equipment:

- Hammer
- Level (2- and 4-foot)
- Straightedge
- Exterior door frame
- Framing square
- Screwdriver
- Handsaw
- Saw horses
- 16d finishing nails (galvanized)
- Woodshims

Procedure:	Evaluation 3	2	1	N
1. Cut rough opening.	___	___	___	___
2. Place the frame and door in opening.	___	___	___	___
3. Adjust the amount of space between the side jambs and rough openings.	___	___	___	___
4. Level door frame with wedge and straightedge.	___	___	___	___
5. Make sure top of the door and head jamb are parallel.	___	___	___	___
6. Drive nail through head casing into trimmer studs.	___	___	___	___
7. Make final check to determine if any adjustment is needed.	___	___	___	___
8. Nail outside casing to studs with finishing nails.	___	___	___	___
9. Use nail set for setting of the nails.	___	___	___	___
10. Have instructor check your work.				
11. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials.	___	___	___	___
Average of above evaluations*	___	___	___	___

*This average is the student's partial evaluation for competency B-4.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 3: EXTERIOR DOOR INSTALLATION/REPAIR

LESSON TEST

Part 1. Match the statement on the left with the correct word or words on the right. Place the correct letter in the space provided to the left.

_____ 1. Casing that is used around doors

_____ 2. Devices attached to window frame for ventilation and to keep out insects

_____ 3. Horizontal glass slats that are held together by a metal frame at each end

_____ 4. Opening in which doors are placed

_____ 5. The outside entrances

_____ 6. Outside glass doors that slide to open

_____ 7. Exterior door to garage for car

_____ 8. Vertical members of a panel door

_____ 9. Horizontal members of a panel door

a. Garage doors

b. Exterior doors

c. Brick molding

d. Stiles

e. Rough opening

ab. Rails

ac. Screens

ad. Exterior sliding glass doors

ae. Jalousies

Part 2. Arrange in order the steps for setting a door frame in a brick wall by listing the letter of each step in order on the blanks at the left.

______10.
______11.
______12.
______13.
______14.
______15.

a. Raise frame up into position in correct relationship to the masonry wall and inside finished wall

b. Measure the height of head jamb above finished floor in relation to floor level

c. Nail braces to frame and fasten braces to floor to secure frame in place for bricklayer

d. Check frame to see if it is square

e. Cut spreader to fit over threshold to hold inside jamb

f. Renail corner braces, if necessary, to make frame perfectly square

Part 3. Arrange in order the steps for installing a garage door by listing the letter of each step in order on the blanks at the left.

______16.
______17.
______18.
______19.
______20.
______21.
______22.
______23.
______24.

a. Attach roller to door

b. Install locks

c. Cut material for framing opening of garage door

d. Reset stops to allow door to open and close smoothly

e. Plumb and square frame to fit door size

ab. Place track on roller and attach track to jamb

ac. Temporarily tack stops in place

ad. Adjust opening and closing, if necessary

ae. Assemble door sections in opening and attach hinges

Part 4. Place a "T" on the blank beside each correct statement concerning installing exterior doors and a "F" beside each incorrect statement.

_____25. The rough opening is the same size as the door

______26. Garage doors are the outside doors to garages for cars

______27. Rails are vertical members of a panel door

______28. Tracks are attached to the garage door

______29. Rollers are attached to the garage door

______30. You plumb and square the opening after the door is hung

______31. Stiles are vertical members of a panel door

______32. Exterior doors are inside doors

______33. The frame should be up before you install the garage door

______34. Exterior sliding glass doors are the glass doors that slide to open

MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT I, LESSON 3 TEST

Part 1.

1. c
2. ac
3. ae
4. e
5. b
6. ad
7. a
8. d
9. ab

Part 2.

10. b
11. e
12. d
13. f
14. a
15. c

Part 3.

16. c
17. e
18. ac
19. ae
20. a
21. ab
22. ad
23. d
24. b

Part 4.

25. F
26. T
27. F
28. F
29. T
30. F
31. T
32. F
33. T
34. T

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 4: DOOR-OPERATING HARDWARE

LESSON OBJECTIVE

After completion of this lesson, the student will be able to IDENTIFY AND INSTALL OPERATING HARDWARE FOR AN EXTERIOR OR INTERIOR DOOR. Mastery will be evidenced by completing the job sheet and by scoring ________ percent on lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Identify different types of hinges.
2. Identify different types of locks.
3. Identify different types of pulls.
4. Install complete door hardware.

Completion of the requirements of this lesson fulfills competencies B-5 and E-4 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 4: DOOR-OPERATING HARDWARE

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Transparency masters
  1. Pulls and miscellaneous hardware
  2. Latches
  3. Locks
  4. Hinges

D. Assignment sheet
  1. Exterior door: hardware and materials

E. Answers to assignment sheet

F. Job sheet
  1. Hang a door unit

G. Lesson test

H. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 4: DOOR-OPERATING HARDWARE

INFORMATION OUTLINE

I. Terms and definitions

   A. Mortised--when a part is recessed or sunk into a piece of wood

   B. Baseboard--the trim board around the bottom edge of a wall

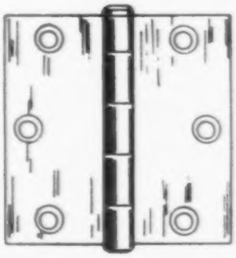
   C. Spring loaded--where pressure is applied to a device by a spring

   D. Hinge--a jointed device that allows a door to swing

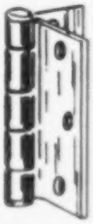
   E. Pull--a device used to open drawers and doors

II. Hinges

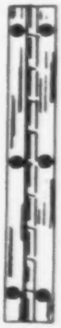
   A. Butt--used to hang doors where both leaves of the hinge are mortised into the wood



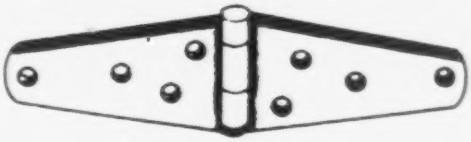
   B. Half-surface butt--used to hang solid doors where only half of the hinge leaves are mortised into the door



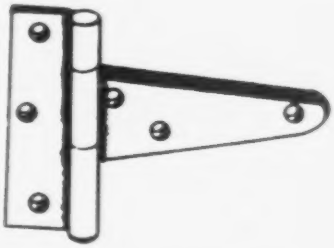
C. Piano or continuous--used on thin materials that are likely to warp



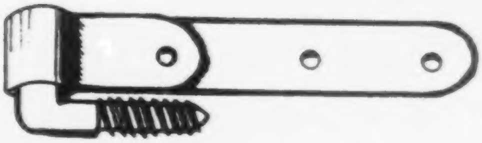
D. Strap--used to hang heavy doors



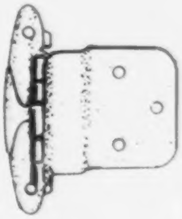
E. T--used to fasten a door to wall studs or gates to post



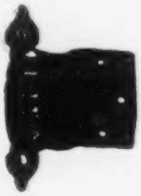
F. Screw hook and strap--used on fence gates



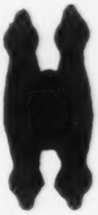
G. Inset--used to hang cabinet doors



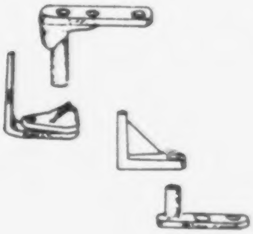
H. Spring-loaded inset--used on cabinet doors without a latch to hold the door open or closed



I. "H"--used on cabinet doors where the whole hinge is exposed for a rustic look

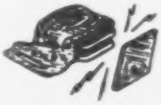


J. Pivot--used on cafe type doors or any swinging door

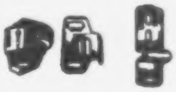


III. Latches

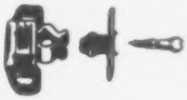
A. Magnetic--holds cabinet door closed with a magnet



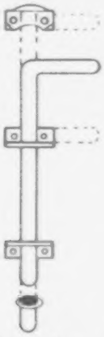
B. Roller--holds cabinet door closed with a spring-loaded roller on a striker plate



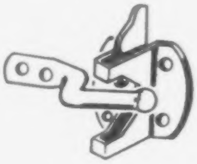
C. Friction--holds cabinet door closed with a friction catch against another plate



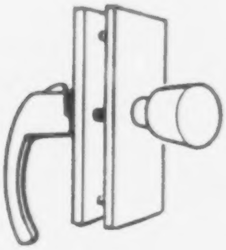
D. Canebolt--holds heavy doors at the bottom in wood or concrete



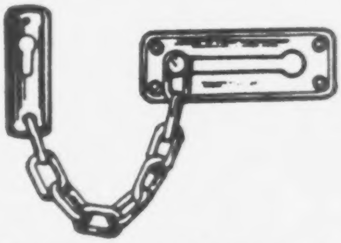
E. Gravity gate latch--holds heavy doors or gates in place when pushed to



E. Storm door--used on storm or screen doors

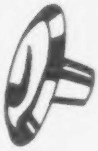


F. Chain door fastener--used as a safety lock that allows the door to be opened about 4 1/2 inches and still be protected from intruders

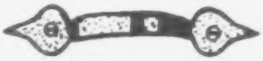


V. Pulls

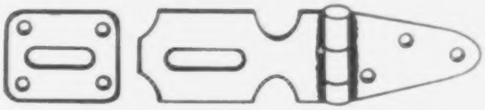
A. Knob--used on drawers or doors of cabinets and uses one screw



B. Handle--used on drawers or doors of cabinets and uses two screws

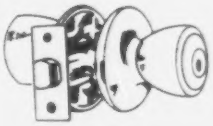


F. Hasp--used on a door where a padlock is required

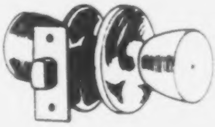


IV. Locks

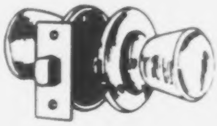
A. Entrance--a keyed lock used on outside doors



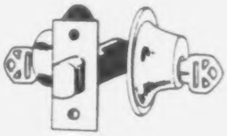
B. Privacy--used on bedrooms and bathroom doors where it can be opened with an emergency key



C. Passage--used on closets or hall doors where no locks are necessary

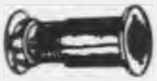


D. Deadbolt--used on exterior doors as a high security device where a bolt with a square head is controlled by a key

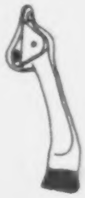


VI. Miscellaneous

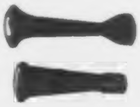
A. Door viewer--installed in exterior doors to allow a person to look outside without opening the door



B. Door holder--attached to the bottom part of a door to hold the door open at any location



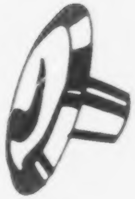
C. Door stop--mounted on the baseboard behind a door to keep the door handle from damaging the wall when opened

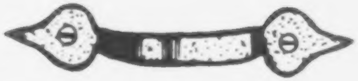


Pulls and Miscellaneous Hardware

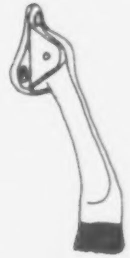
CFP 65

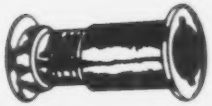
Pulls

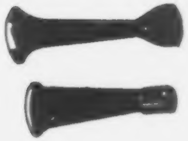

Knob


Handle

Miscellaneous

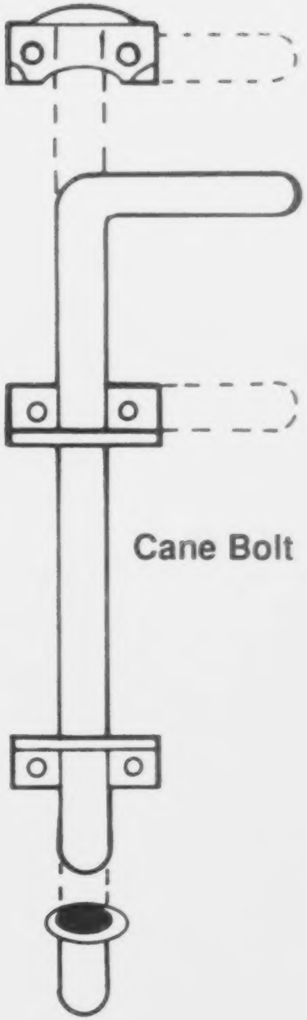

Door Holder


Door Viewer


Door Stop

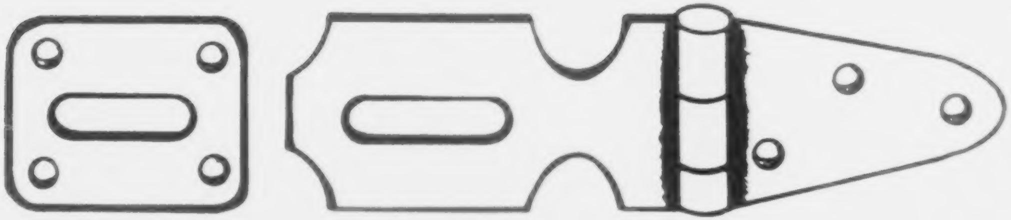
TM 1

Latches

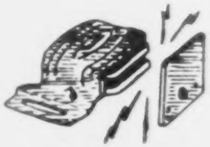


Cane Bolt

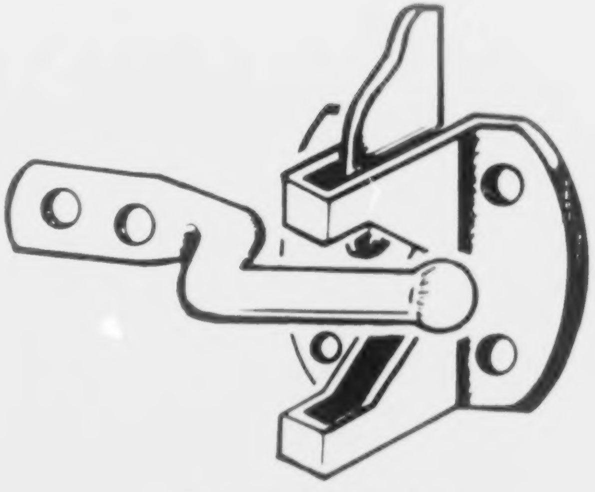
CFP 67



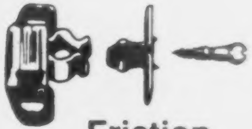
Hasp



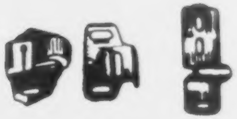
Magnetic



Gravity Gate Latch



Friction

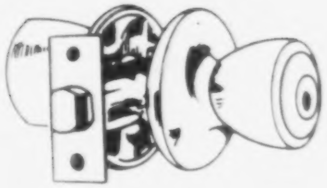


Roller

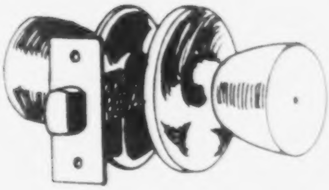
TM 2

TM 3

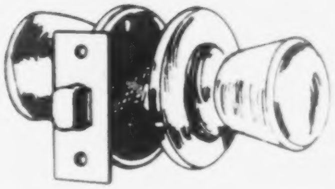
Locks



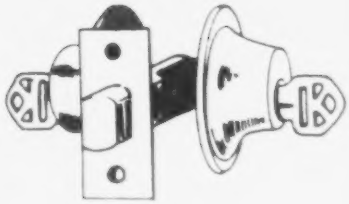
Entrance



Privacy

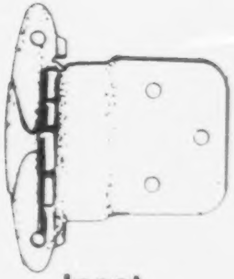


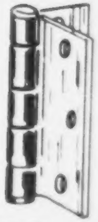
Passage

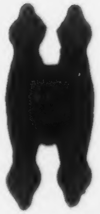


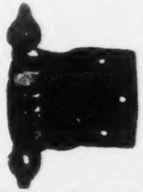
Deadbolt

Hinges

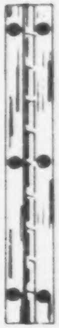

Inset

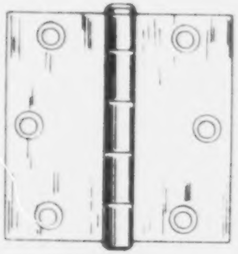

Half Surface Butt

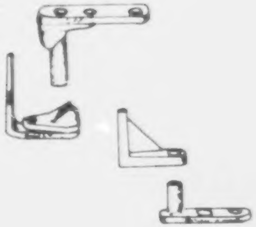

"H " Hinge

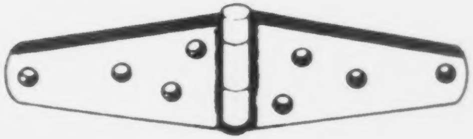

Spring Loaded Inset Hinge

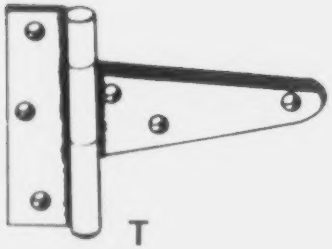
CFP 71

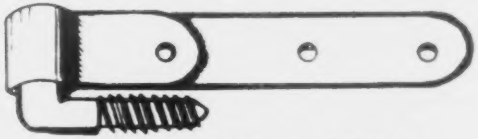

Piano or Continuous


Butt


Pivot Hinge


Strap


T

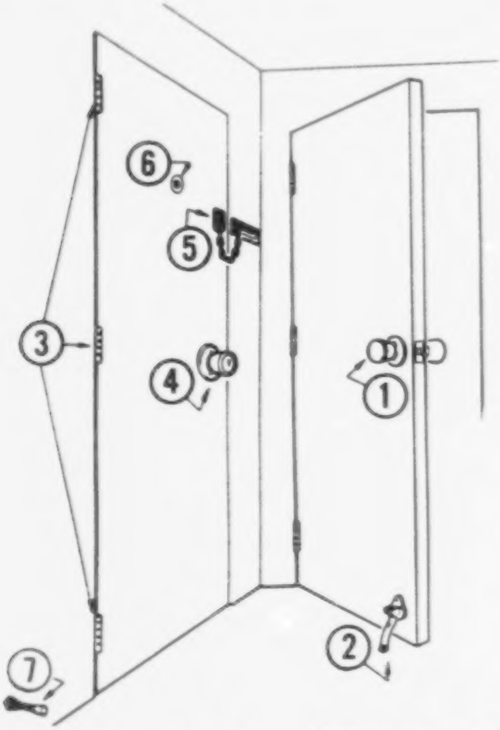

Screw Hook and Strap

TM 4

AS 1

EXTERIOR DOOR: HARDWARE AND MATERIALS

Directions: From the drawing below, point out the location of each piece of hardware by matching a letter from the list with the numbers on the picture.



_____ 1.

_____ 2.

_____ 3.

_____ 4.

_____ 5.

_____ 6.

_____ 7.

a. Entrance lock

b. Chain door fastener

c. Passage lock

d. Butt hinge

e. Door stop

ab. Door holder

ac. Door viewer

Satisfactory completion of this assignment sheet partially fulfills competencies B-5 and E-4 of Building Maintenance.

ANSWERS TO ASSIGNMENT SHEET 1

1. c
2. ab
3. d
4. a
5. b
6. ac
7. e

HANG A DOOR UNIT

Equipment:

Complete door unit
Nails
Level
Framing square
Hand drill
13 oz. hammer
Wood chisel
Screwdriver

Procedure:

Evaluation
3 2 1 N

1. Trim any wallboard or sub-covering that extends into the rough opening for the door. __ __ __ __

2. Check the rough opening and the door unit size. __ __ __ __

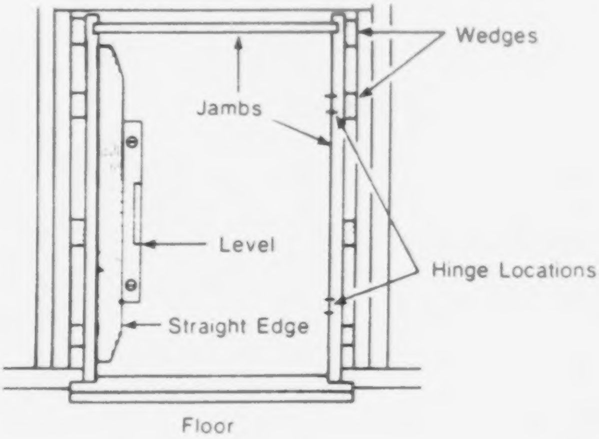
   (Note: There should be some space between the door jambs and the rough opening studs.)

3. Determine the direction the door should open. __ __ __ __

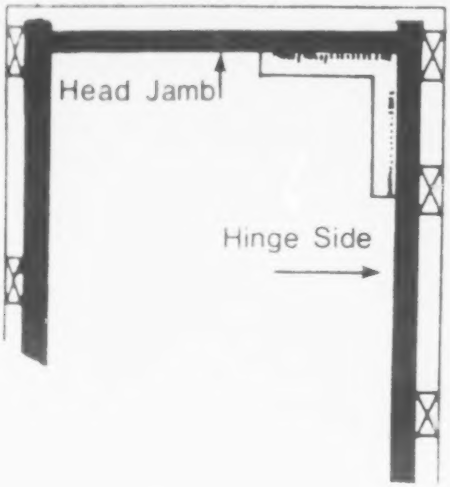
4. Install the door jamb unit in the rough opening. __ __ __ __

   (Note: Use shim blocks or double shingle blocking where required.)

5. Plumb the hinge side on the door with a level and nail in place. __ __ __ __



6. Square the head jamb to the hinge side of the door and tack in place. ____



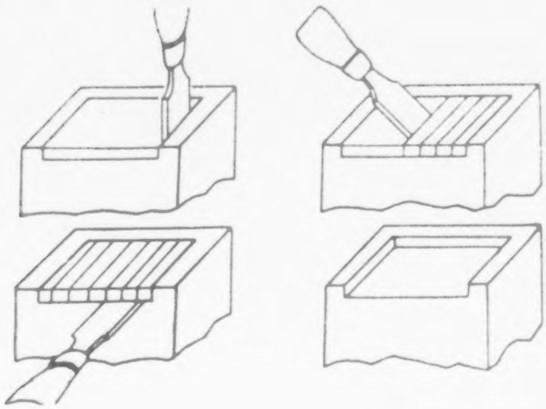
7. Plumb the other door jamb and nail in place. ____

8. Mark the locations for the hinges on the door edge and side of jamb if necessary. ____

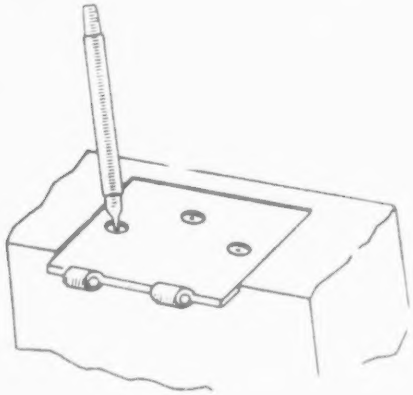
(Note: Measurements should be made on the door first and transferred to the side jamb.)

(CAUTION: Allow 1/16 inch clearance between the top jamb and the top of the door to prevent sticking.)

9. Cut out the mitered area for the hinges with the chisel.



10. Mark the location for the screws through the hinge leaf.



11. Drill small holes for the screws. ___ ___ ___ ___

12. Install the hinge leaves on the door sides and jambs. ___ ___ ___ ___

13. Hang the door in place. ___ ___ ___ ___

(Note: There should be proper clearance around the door.)

14. Install door viewer. ___ ___ ___ ___

15. Install door locks. ___ ___ ___ ___

16. Install door stop. ___ ___ ___ ___

17. Install door handle. ___ ___ ___ ___

18. Have instructor check your work.

19. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials. ___ ___ ___ ___

Average of above evaluations* ___ ___ ___ ___

***This average is the student's partial evaluation for competencies B-5 and E-4 of Building Maintenance.**

MODULE: CARPENTRY AND FINISHING PROCEDURES

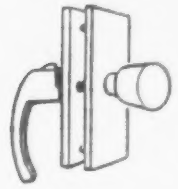
UNIT I: EXTERIOR CARPENTRY

LESSON 4: DOOR-OPERATING HARDWARE

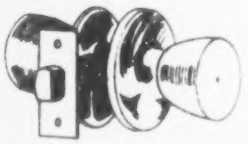
LESSON TEST

Part 1. Identify the types of locks used on doors. Write the correct letter from the list on the blank beneath its picture.

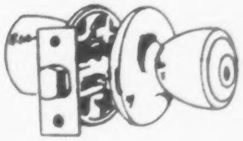
a. Entrance
b. Privacy
c. Passage
d. Deadbolt
e. Storm door
ab. Chain door fastener



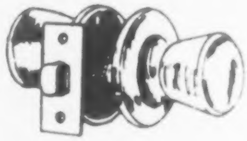
1. ________________



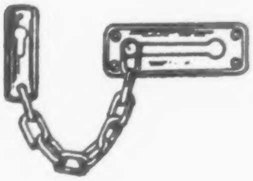
2. ________________



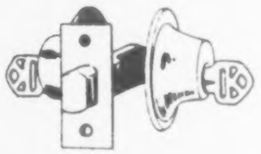
3. ________________



4. ________________



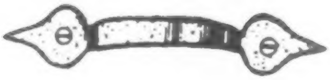
5. ________________



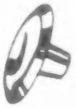
6. ________________

Part 2. Identify the types of pulls used in construction. Write the correct letter from the list on the blank beneath its picture.

a. Knob
b. Handle
c. Gripper



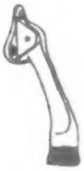
7.____________________________



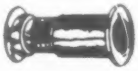
8.____________________________

Part 3. Identify the miscellaneous hardware used in construction. Write the correct letter from the list on the blank beneath its picture.

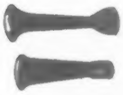
a. Door viewer
b. Door holder
c. Door stop



9.____________________________



10.____________________________



11.____________________________

MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT I, LESSON 4 TEST

Part 1.

1. e
2. b
3. a
4. c
5. ab
6. d

Part 2.

7. b
8. a

Part 3.

9. b
10. a
11. c

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 5: EXTERIOR WINDOW INSTALLATION/REPAIR

LESSON OBJECTIVE

After completion of this lesson, the student will be able to IDENTIFY THE PARTS OF A WINDOW; INSTALL A WINDOW UNIT; AND REPLACE WINDOW GLASS. Mastery will be evidenced by completion of job sheets and by scoring ________ percent on the lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Identify the parts of a window.
2. Install a window unit.
3. Replace a broken glass.

Completion of the requirements of this lesson fulfills competency B-6 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 5: EXTERIOR WINDOW INSTALLATION/REPAIR

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Transparency master
    1. Parts of a window unit

D. Job sheets
    1. Hang a window unit
    2. Replace broken glass

E. Lesson test

F. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 5: EXTERIOR WINDOW INSTALLATION/REPAIR

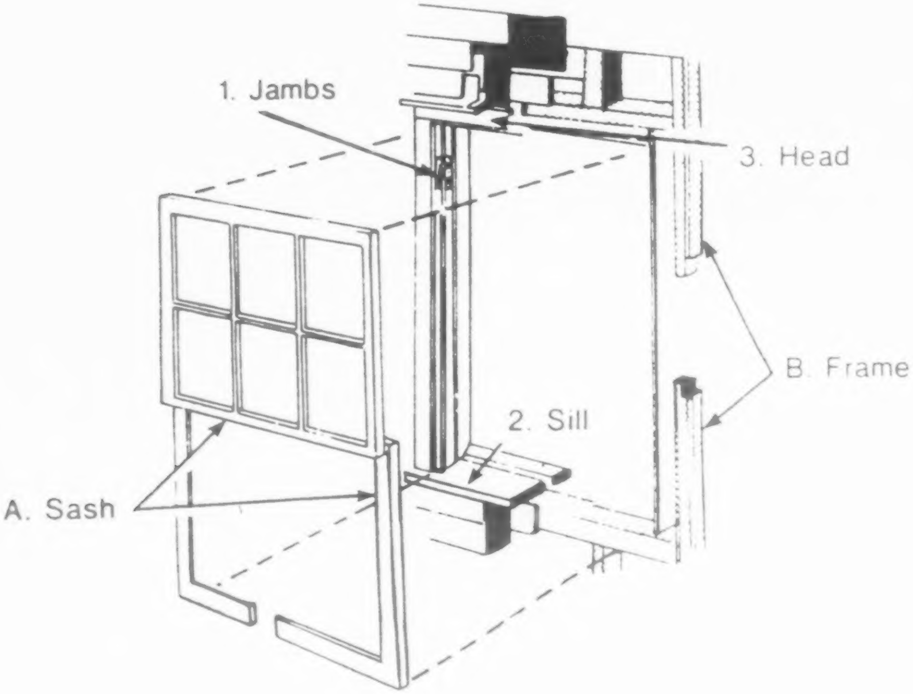
INFORMATION OUTLINE

I. Window unit construction

  A. Sash--portion of window that supports the glass

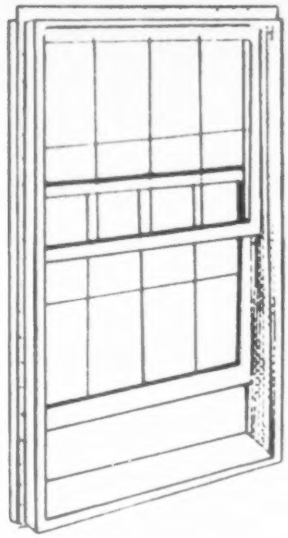
  B. Frame or casing--the outer part of the window that is fixed to the wall

    1. Jambs--the two side members of the frame
    2. Sill--the bottom member of the frame
    3. Head--the top member of the frame

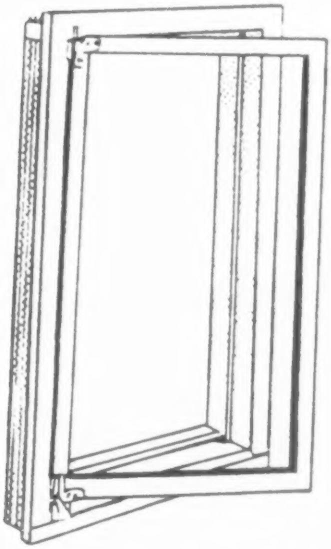


II. Types of windows

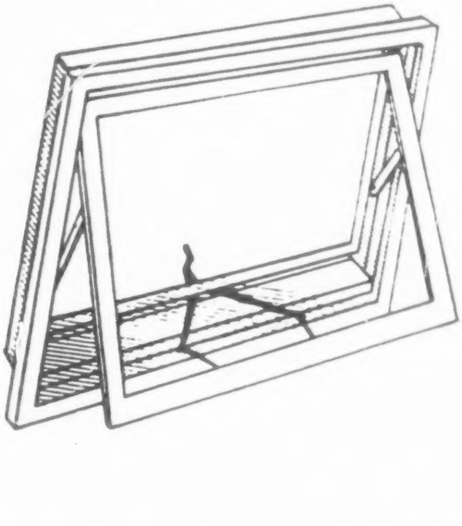
A. Double hung--a window unit consisting of two sashes that slide vertically past each other



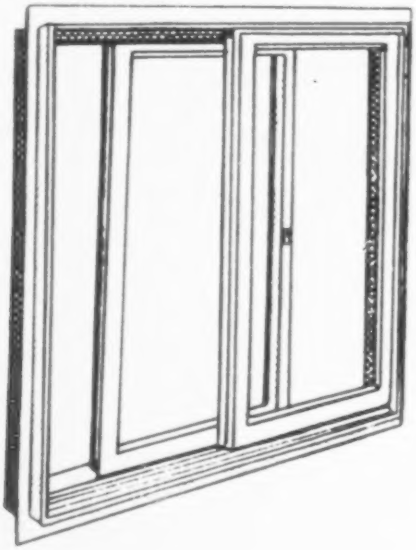
B. Casement--a window unit that has the sash swung on the side



C. Awning--a window unit hinged on the top

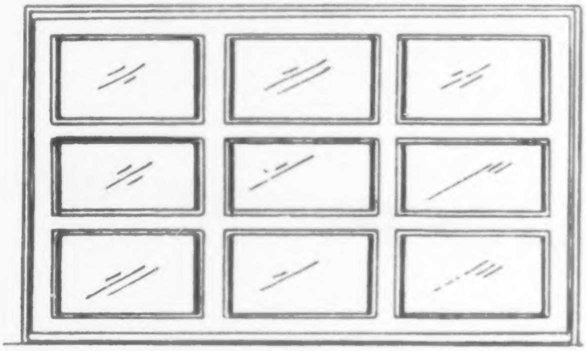


D. Sliding--a window unit consisting of two or more sashes, one fixed and one sliding horizontally



E. Fixed glass or picture window--a window unit that is fixed in place with no moving parts and is used mainly in commercial buildings

(NOTE: Construction can be either wood or aluminum)



III. Types of glass used in windows

A. SSB
   1. Single strength
   2. About 1/32 inch thick

B. DSB
   1. Double strength
   2. About 1/16 inch thick

C. Crystal sheet
   1. Very durable
   2. About 7/32 inch thick

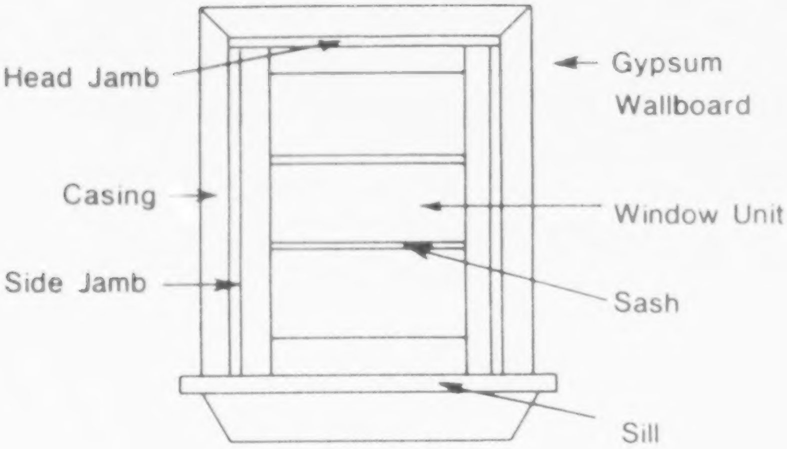
D. Plate
   1. Large-sized sheets
   2. About 1/4 inch thick

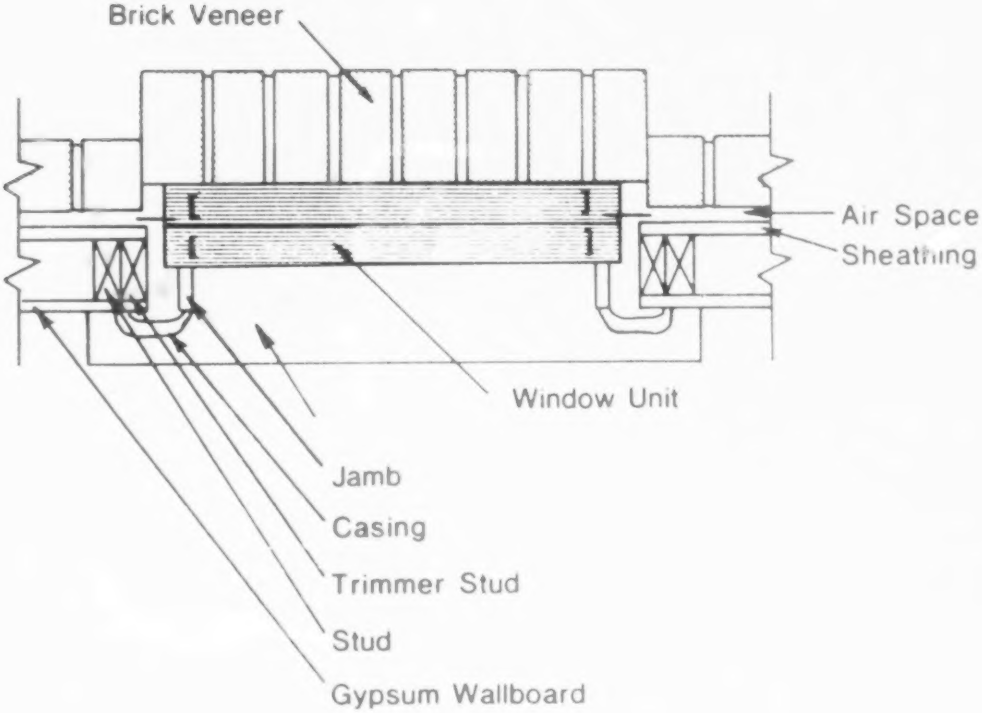
E. Insulating
   1. Two or more sheets of glass
   2. Separated by air space

F. Tempered
   1. Shatterproof
   2. Hardened by special process

G. Plexiglass
   1. A plastic substitute for glass
   2. Shatterproof

Parts of a Window Unit


Head Jamb
Gypsum Wallboard
Casing
Window Unit
Side Jamb
Sash
Sill


Brick Veneer
Air Space
Sheathing
Window Unit
Jamb
Casing
Trimmer Stud
Stud
Gypsum Wallboard

HANG A WINDOW UNIT

Equipment:

Complete aluminum window unit
Nails
Level
Framing square
13 oz. hammer
Wood chisel

Procedure

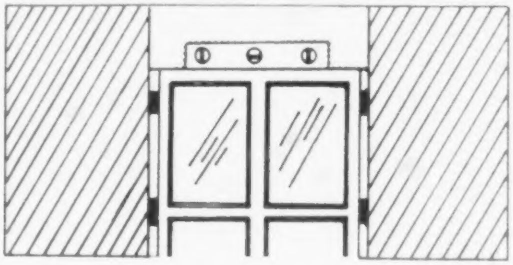
Evaluation
3 2 1 N

1. Check the rough opening and the window unit size. ___ ___ ___ ___

   (NOTE: There should be some space between the window frame and the rough opening studs.)

2. Install the window frame in the rough opening on top of the sub-covering. ___ ___ ___ ___

3. Level the window in the opening. ___ ___ ___ ___



4. Shim around the window frame to secure in place. ___ ___ ___ ___

5. Nail the frame in place. ___ ___ ___ ___

6. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials. ___ ___ ___ ___

Average of above evaluations *

***This average is the student's partial fulfillment for competency B-6 of Building Maintenance.**

REPLACEMENT OF BROKEN GLASS

Equipment:

Replacement glass cut to size
Glazing compound or putty
Putty knife
Glazier points, No. 1 or 2
Paint or linseed oil
Paint brush
13 oz. hammer
Driver for glazier points
Eye protection

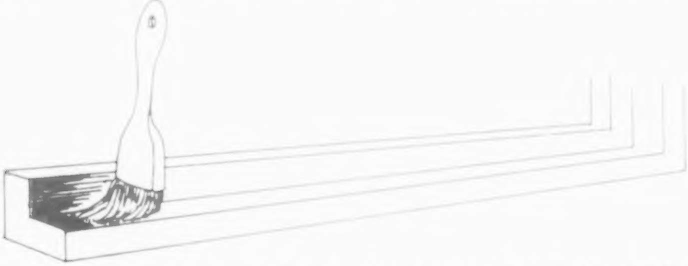
Procedures:

Evaluation
3 2 1 N

1. Remove the old putty with the putty knife being careful not to chip away any of the wood of the sash. ____ ____ ____ ____

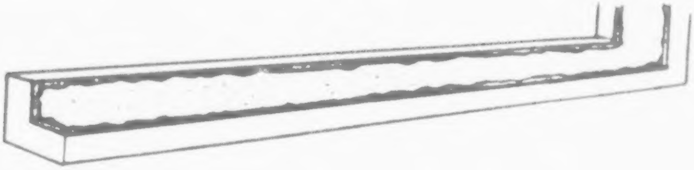
2. Remove the old glazier point and, being very careful, remove the broken glass pieces. ____ ____ ____ ____

3. Clean and smooth both sides of the rabbet. The rabbet is the groove cut for the glass. ____ ____ ____ ____



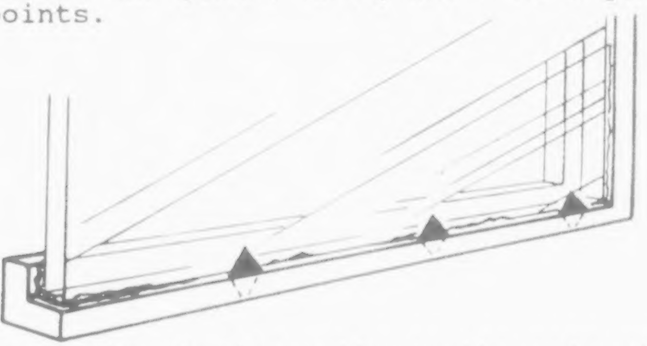
4. If the surface of the rabbet is unpainted, prime with paint or linseed oil. Glazing compound should not be applied to bare wood because the bare wood absorbs the oil in the glazing compound, leaving it dry. ____ ____ ____ ____

5. Apply a thin coat of glazing putty to the rabbet.



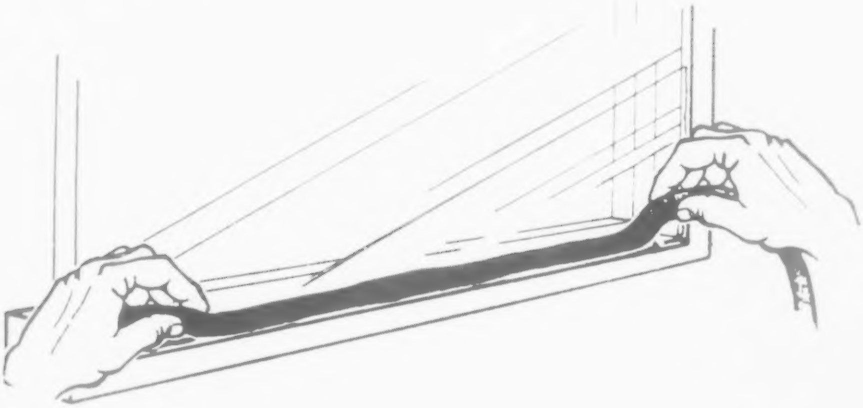
6. Insert the sized glass into the opening and press it firmly against the thin coat of putty.

7. Fasten the glass, using No. 1 or 2 glazier points.

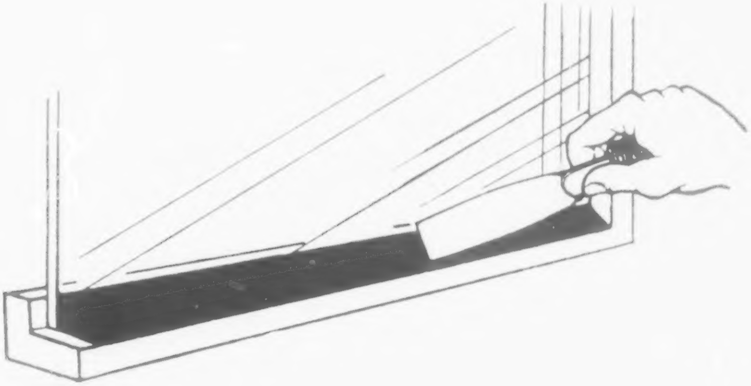


8. Knead the glazing putty in the palm of your hand until it is soft and pliable.

9. Roll the glazing putty into a long pencil-like roll and lay it over the glass along the rabbet.



10. Spread evenly and firmly with a putty knife, using sufficient glazing putty and forming a bevel from the glass to the top of the rabbet.



11. Wipe off excess glazing compound.

12. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials.

Average of above evaluations*

*This average is the student's partial evaluation for competency B-6 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

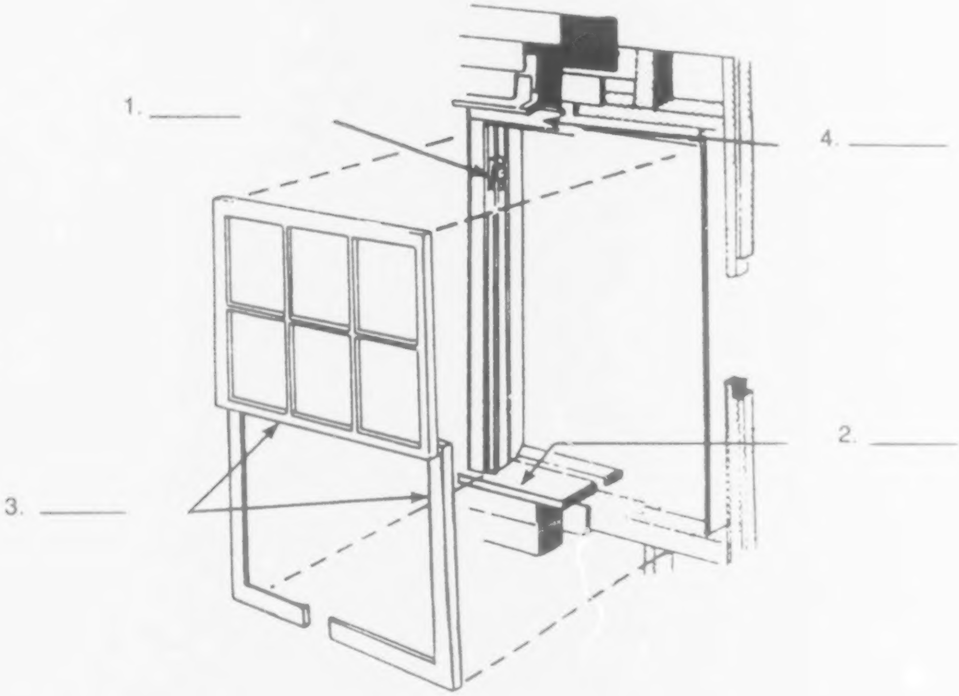
UNIT I: EXTERIOR CARPENTRY

LESSON 5: EXTERIOR WINDOW INSTALLATION/REPAIR

LESSON TEST

Part I. Identify the parts of a window unit by writing the letter of the correct name from the list on the blank provided.

A.	Head jamb	C.	Jambs
B.	Sash	D.	Sill



Part 2. Point out the types of glass used in window construction by writing the correct letter from the list below on the blank beside each description.

A. SSB
B. RSP
C. DSB
D. Plate
E. Crystal
AB. Plexiglass
AC. Tempered
AD. Insulating

Identify the types of windows used in construction by writing the correct letter from the list on the blank below the picture.

______ 5. Single strength glass about 1/32 inch thick

______ 6. Double strength glass about 1/16 inch thick

______ 7. Two or more sheets of glass separated by air space

______ 8. A shatterproof plastic substitute for glass

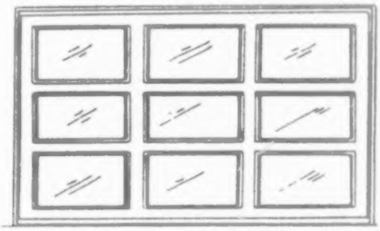
______ 9. Large sized sheets about 1/4 inch thick

______ 10. Glass hardened by a special process to make it shatterproof

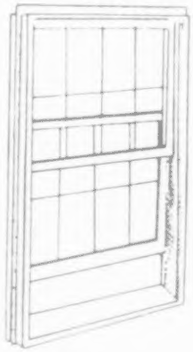
______ 11. A very durable glass about 7/32 inch thick

Part 3. Identify the types of windows used in construction by writing the correct letter from the list below on the blank under the picture it matches.

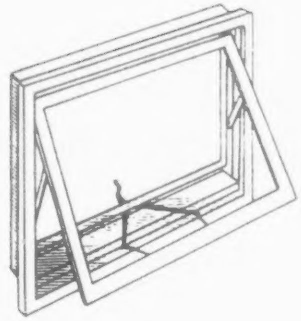
A. Awning
B. Double hung
C. Casement
D. Picture
E. Sliding

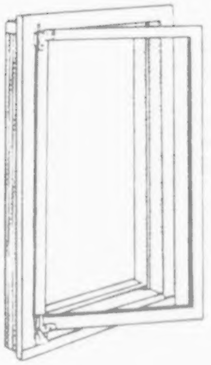


12. ______________________________

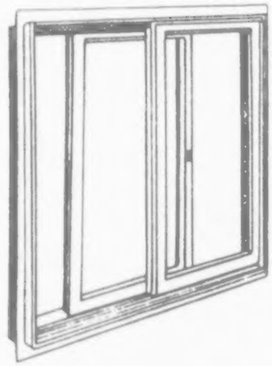


13. ______________________________





14. ______________________________ 15. ______________________________



16. ______________________________

CFP 103

MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT I, LESSON 5 TEST

1. C
2. D
3. B
4. A
5. A
6. C
7. AD
8. AB
9. D
10. AC
11. E
12. D
13. B
14. A
15. C
16. E

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 6: WINDOW CLEANING

LESSON OBJECTIVE

After completion of this lesson, the student will be able to CLEAN EXTERIOR WINDOWS. Mastery will be evidenced by completion of job sheets.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Clean a window using a spray bottle and cloth.
2. Clean a window using a window squeegee and sponge.

Completion of the requirements of this lesson fulfills competency B-7 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 6: WINDOW CLEANING

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Job sheets
   1. Cleaning a window with spray cleaner
   2. Cleaning a window with a window squeegee and sponge

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 6: WINDOW CLEANING

INFORMATION OUTLINE

I. Definition of terms

   A. Window squeegee--a T-shaped tool having the crossbar edged with a strip of rubber used to scrape water from the window

II. Two methods of cleaning windows

   A. Window cleaner in a spray bottle

   B. Window cleaner in a pail using a window squeegee and sponge

JS 1

CLEANING A WINDOW WITH SPRAY CLEANER

Equipment:

Glass cleaner
Spray bottle
Cotton cloth or
Paper towels

Procedure:	Evaluation			
	3	2	1	N
1. Select the correct tools and material.	___	___	___	___
2. Spray glass cleaner on glass.	___	___	___	___
3. Wipe window clean with paper towels or a cotton cloth.		___	___	___
4. Have instructor check your work.	___	___	___	___
5. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials.	___	___	___	___
Average of above evaluations*	___	___	___	___

*This average is the student's partial evaluation for competency B-7 of Building Maintenance.

JS 2

CLEANING A WINDOW USING A SQUEEGEE AND SPONGE

Equipment:

Glass cleaner
Pail
Window squeegee
Sponge
Brush
Cotton cloth
Ladder

Procedure:	Evaluation			
	3	2	1	N
1. Put cleaner in pail.	___	___	___	___
2. Put brush on pole.	___	___	___	___
3. Set up ladder if needed.	___	___	___	___
4. Put cleaner on window with sponge; brush clean.	___	___	___	___
5. Put squeegee on pole.	___	___	___	___
6. Use the squeegee to scrape cleaner from window.	___	___	___	___
7. Take cloth and wipe off squeegee.	___	___	___	___
8. Take sponge and clean around edge of window.	___	___	___	___
9. Have instructor check your work.				
10. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials.	___	___	___	___
Average of above evaluations*	___	___	___	___

*This average is the student's partial evaluation for competency B-7 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 7: EXTERIOR SIDING

LESSON OBJECTIVE

After completion of this lesson, the student will be able to IDENTIFY VARIOUS TYPES OF EXTERIOR SIDING AND PROCEDURES FOR REPAIRING AND/OR REPLACING SIDING. Mastery will be evidenced by scoring___________ percent on the lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Define terms associated with exterior siding.
2. Identify characteristics of various types of exterior siding.
3. Identify procedures for repairing and/or replacing siding.

Completion of the requirements of this lesson fulfills competency B-8 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 7: EXTERIOR SIDING

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Transparency masters
   1. Styles of siding
   2. Parts of a cornice

D. Lesson test

E. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 7: EXTERIOR SIDING

INFORMATION OUTLINE

I. Terms and definitions

   A. Bevel siding (clapboards)--wall covering that is thicker on one edge than the other

   B. Board and batten siding--vertical siding made of rough-sawn boards with narrow strips called battens, which are used to cover the joint between the boards

   C. Drop siding--wall covering with tongue and groove or shiplap edges

   D. Flashing--material used above windows and doors to prevent water from entering

   E. Horizontal siding--wall covering which is installed with a beveled look

   F. O.C.--abbreviation for "on center." It stands for the distance from the center of one structural member to the center of the next one

   G. Siding--exterior wall covering, including metal, plastic (usually vinyl), and plywood. Does not include masonry coverings such as brick or rock veneer or stucco

   H. Shiplapped--mitered on the backside so that the pieces fit over the top of one another horizontally

   I. Starter strip--a bottom strip nailed on the wall sheathing to get the proper bevel for the first strip of siding

   J. Tongue and groove--a joint made by fitting a tongue on the edge of a board into a matching groove on another board

   K. Vertical siding--wall covering which is installed vertically

II. Types of exterior wall coverings
   A. Wood siding
      1. Board and batten siding
      2. Shiplap siding
      3. Tongue-and-groove siding

   B. Wood shingles

   C. Plywood--vertical

   D. Wood fiberboard
      1. Vertical
      2. Horizontal

   E. Aluminum or steel siding
      1. Vinyl siding
      2. Metal siding

   F. Masonry
      1. Brick veneer
      2. Rock veneer
      3. Stucco

III. Styles of siding (TM 1)
   A. Bevel (lap siding)

   B. Clapboard (lap siding)

   C. Drop siding (shiplapped)

   D. Drop siding (tongue-and-groove)

IV. Parts of a Cornice (TM 2)
   A. For siding

   B. For brick veneer

V. Characteristics of aluminum and vinyl siding
   A. Economical

   B. Low maintenance

   C. Used for both new and re-siding application over existing siding

   D. Made in horizontal lapboard and vertical-board look-alike styles with smooth or embossed wood-grain surfaces.

   E. Available in different sizes and colors.

VI. Differences between aluminum and vinyl siding

   A. Aluminum siding dents and scratches easily

   B. Vinyl siding resists dents. The color goes all the way through the siding

VII. Procedures for repairing/replacing aluminum and vinyl siding (TM 3)

   A. Snap a level line all around the house 1 1/2 inches higher than the lowest point to be covered with siding --apply the inside and outside corner posts first so it will be installed 1/2 inch below bottom of starter strip --space nails 12 inches apart

   B. Install starter strip on level line and space nails 12 inches to 16 inches apart, all along the building

   C. Install J-channel (also called J-molding) on the side of all window and door openings

   D. On horizontal siding, the first siding panel is snapped into the starter strip and nailed 16 inches O.C.--hang the siding from the nails so that lateral movement is permitted freely

   E. When overlapping one horizontal panel over another, the overlap should be away from prominent viewing point (the front of the house or front door)

   F. The amount of overlap of each panel should be 1/2 of the factory-cut overlap notch--the second and other panels are snapped onto the previously installed panels, then nailed, with staggered or breaking joints

   G. Undersill trim is used under windows to trim off cut edges of panels

   H. Siding is run up along sides of window and door openings --leave room near the top to install head flashing-- after installing head flashing, siding is continued upward

   I. Top or last panel is finished off using same method as undersill trim

   J. For gable or dormer trim: use J-channel where the siding meets the junction of wall and roof lines at an angle

K. Clean up siding to remove finger prints and soiled areas

L. Check siding using the following checklist before having the siding project evaluated by instructor

VIII. Checklist for evaluating repaired or replaced siding

A. Is siding level?

B. Are corners plumb?

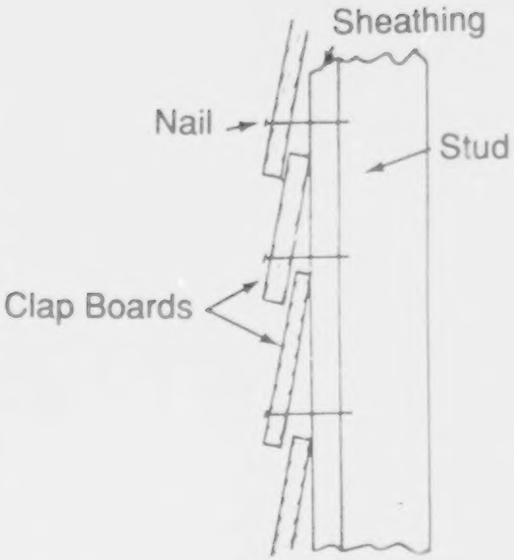
C. Are there smooth-cut edges where siding butts into J-molding and trim?

D. Are overlapping joints flat?

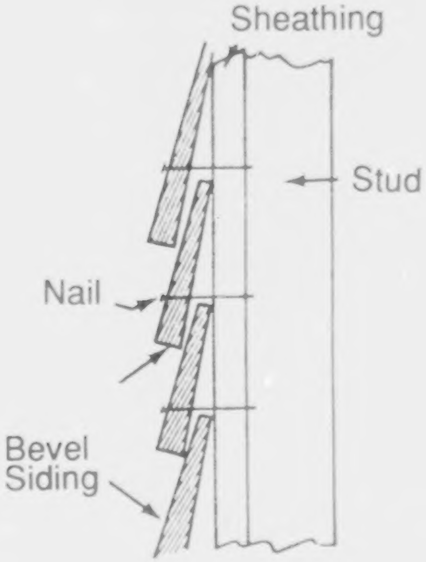
E. Are there waves in the siding?

F. Can joints be seen from the front of the building?

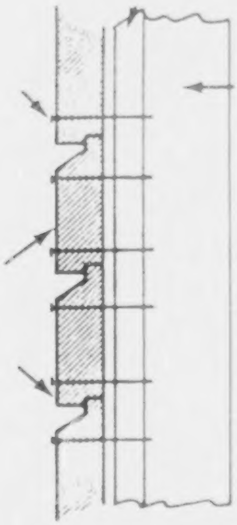
Styles of Siding


Sheathing
Nail
Stud
Clap Boards

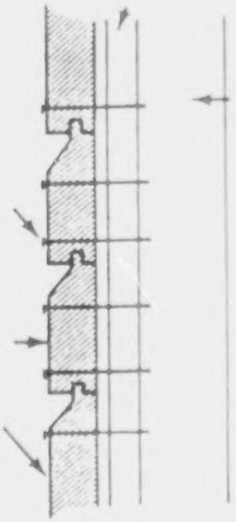
Clap Boards
(Lap Siding)


Sheathing
Stud
Nail
Bevel Siding

Bevel Siding
(Lap Siding)



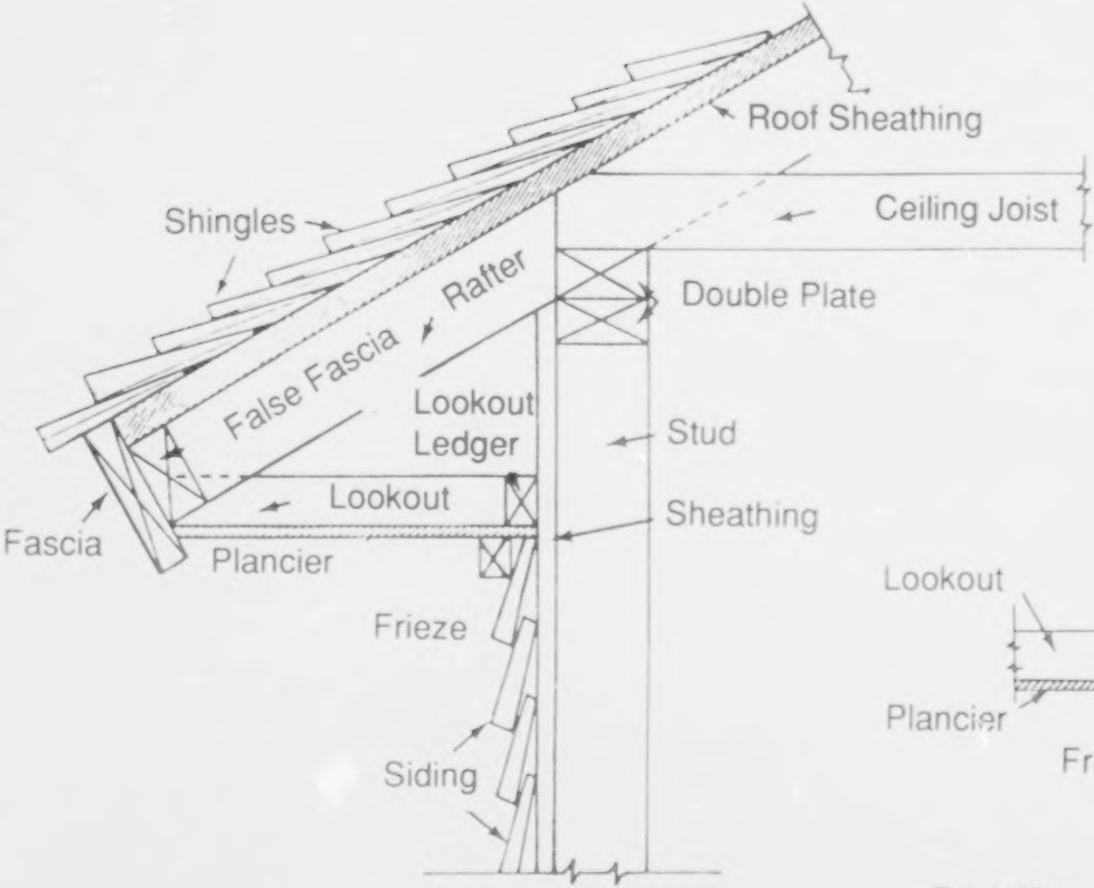
Drop Siding
(Shiplapped)



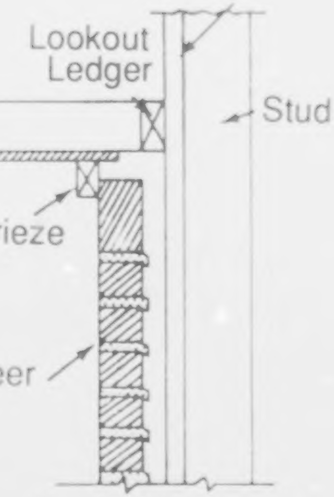
Drop Siding
(Tongue-and-Groove)

Parts of a Cornice

CFP 127


Roof Sheathing
Ceiling Joist
Shingles
Rafter
Double Plate
False Fascia
Lookout Ledger
Stud
Lookout
Sheathing
Fascia
Plancier
Frieze
Siding

For Siding


Lookout
Lookout Ledger
Stud
Plancier
Frieze
Brick Veneer

For Brick Veneer

TM 2

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 7: EXTERIOR SIDING

LESSON TEST

Part 1: Place a "T" on the blank beside correct statements about exterior siding and an "F" beside incorrect statements.

______ 1. Drop siding is made of metal

______ 2. Vertical siding runs up and down

______ 3. Plywood is installed horizontally

______ 4. Board and batten siding is the same as shiplap siding

______ 5. Horizontal siding is installed up and down

______ 6. Shiplap siding is a wood siding

______ 7. Stucco siding is a masonry finish

______ 8. Drop siding is tongue-and-groove

______ 9. Wood shingles are a type of exterior wall siding

______10. Vinyl can be used as exterior siding

______11. When installing metal siding, drive nails very tightly so that siding cannot move laterally

Part 2: Choose the letter of the correct response to each question and write it on the blank at the left.

______ 12. What is flashing?

a. Metal siding

b. Molding used where the siding meets the junction of wall and roof lines

c. Material used above windows and doors to prevent water from entering

d. Floor covering

_____ 13. What does O.C. stand for:

a. On center
b. Off center
c. Over center
d. Outside corner

_____ 14. What is siding?

a. Masonry wall covering, such as stucco
b. Wooden roof covering
c. Interior wall covering, such as fiberboard
d. Exterior wall covering, such as metal or vinyl

Part 3. Place a "T" on the blank beside correct statements concerning procedures for repairing/replacing aluminum and vinyl siding and an "F" beside incorrect statements.

_____ 15. Apply inside and outside corner posts before installing siding

_____ 16. Install corner posts 1/2 inch below the bottom of the starter strip

_____ 17. Install J-molding on the sides of all window and door openings

_____ 18. Hang siding from nails so that no lateral movement is permitted

_____ 19. Undersill trim is used under doors

_____ 20. When overlapping one horizontal panel over another, the overlap should be away from the front of the house or front door

Part 4. Identify the characteristics of siding by writing the correct letter from the list on the blank lines.

a. Aluminum siding
b. Vinyl siding
c. Both aluminum and vinyl siding

_____ 21. Dents and scratches easily

_____ 22. Available in different sizes and colors

_____ 23. Color goes all the way through the siding

_____ 24. Made in horizontal lapboard and vertical-board look-alike styles with smooth or embossed wood-grain surfaces

_____ 25. Low maintenance

_____ 26. Resists dents

MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT I, LESSON 7 TEST

Part 1.

1. F
2. T
3. F
4. F
5. F
6. T
7. T
8. T
9. T
10. T
11. F

Part 2.

12. c
13. a
14. d

Part 3.

15. T
16. T
17. T
18. F
19. F
20. T

Part 4.

21. a
22. c
23. b
24. c
25. c
26. b

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 8: REPAIRING EXTERIOR TRIM

LESSON OBJECTIVE

After completion of this lesson, the student will be able to IDENTIFY THE PARTS OF EXTERIOR TRIM AND REPAIR/REPLACE EXTERIOR TRIM. Mastery will be evidenced by satisfactory completion of assignment sheet and job sheet and by scoring__________percent on lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Identify the different terms associated with exterior trim.
2. Repair fascia and soffit of closed or boxed cornice on a gable roof.

Completion of the requirements of this lesson fulfills competency B-9 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 8: REPAIRING EXTERIOR TRIM

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Transparency masters
    1. Parts of a closed or boxed cornice
    2. Types of cornices
    3. Parts of an open cornice

D. Assignment sheet
    1. Exterior trim

E. Job sheet
    1. Repair fascia and sof[illegible] of closed or boxed cornice on a gable roof

F. Lesson test

G. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 8: REPAIRING EXTERIOR TRIM

INFORMATION OUTLINE

I. Terms and definitions
    A. Cornice--the trim around the ends of the rafters, including fascia, shingle mold, soffit, and frieze or brick mold

    B. Fascia--the horizontal member of a cornice that is attached to the rafter tails

    C. Shingle mold--a small piece of trim at the top of the fascia, usually 3/4 inch by 1 1/2 inches, used to keep the moisture off the fascia

    D. Soffit--the bottom member of a cornice made of plywood that covers the rafters

    E. Frieze mold--the cornice member that seals between the rafters and ceiling joists and covers the top edge of the siding

    F. Lookout--the member of a closed cornice to which the soffit is nailed

    G. Ledger--the member of a cornice that attaches the lookout to the wall

II. Types of cornices

    A. Open

    B. Closed or box

III. Parts of an open cornice

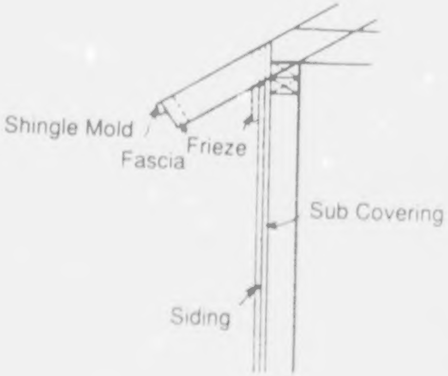
    A. Frieze

    B. Fascia

    C. Shingle mold

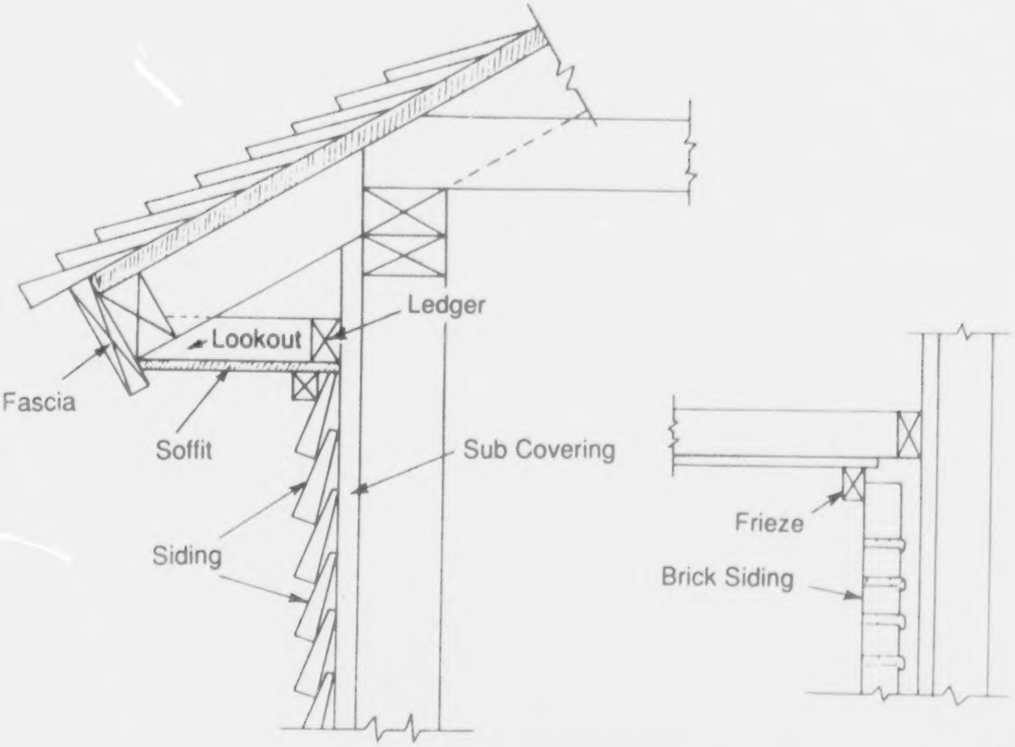
    D. Siding

    E. Sub covering

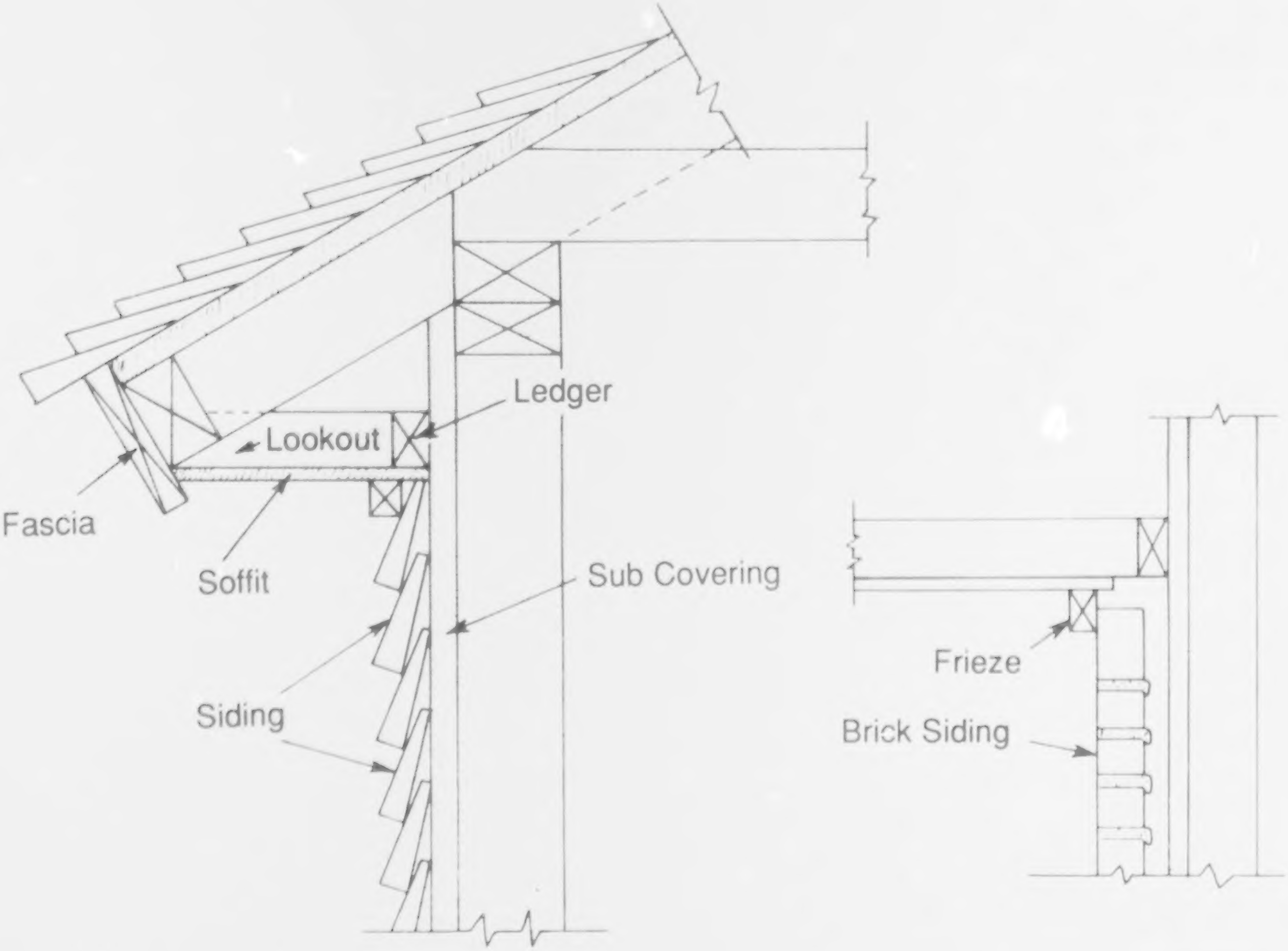


IV. Parts of a closed or box cornice

- A. Soffit
- B. Frieze
- C. Lookout
- D. Fascia
- E. Brick siding
- F. Sub covering
- G. Ledger


Ledger
Lookout
Fascia
Soffit
Sub Covering
Siding
Frieze
Brick Siding

Parts of a Closed or Boxed Cornice

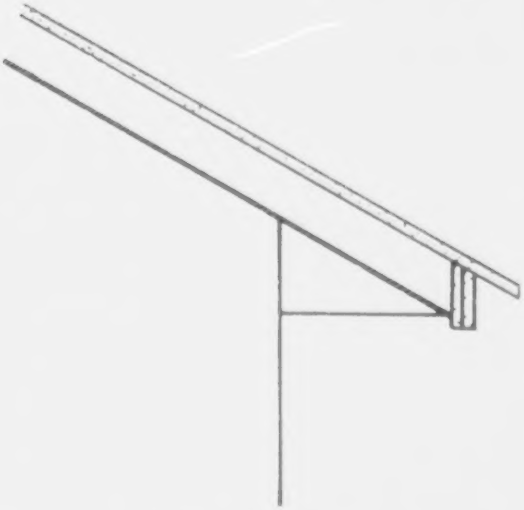

Ledger
Lookout
Fascia
Soffit
Sub Covering
Siding
Frieze
Brick Siding

CFP 141

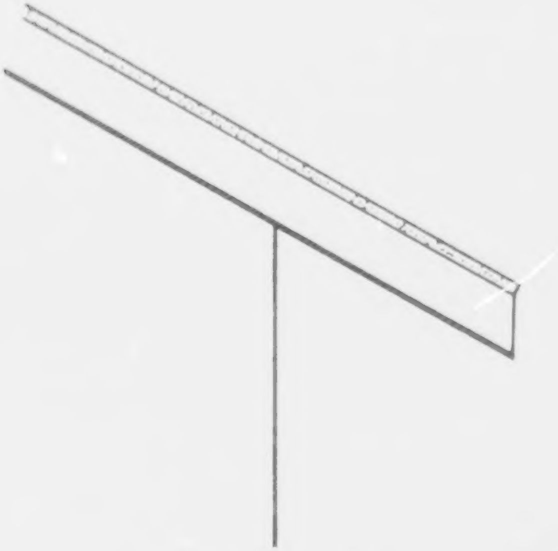
TM 1

TM 2

Types of Cornices

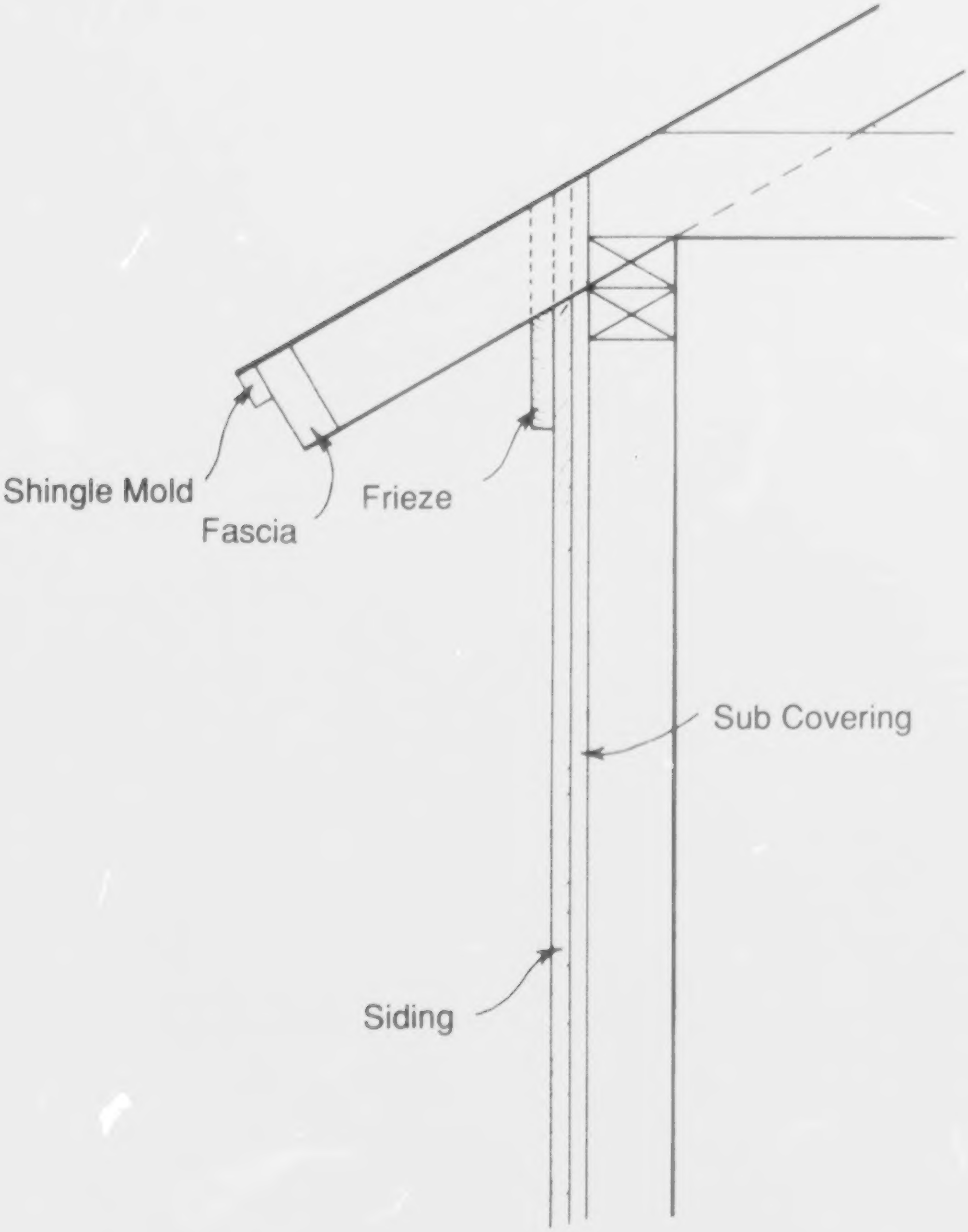


Horizontal Closed or Box Cornice



Open Cornice

Parts of an Open Cornice


Shingle Mold
Fascia
Frieze
Sub Covering
Siding

EXTERIOR TRIM

Directions: From the words listed below, match the letters of the terms with their definitions. Write the correct letter in the blank at the left.

a.	Cornice	e.	Frieze mold
b.	Fascia	ab.	Lookout
c.	Shingle mold	ac.	Ledger
d.	Soffit		

_____ 1. The member of a closed cornice to which the soffit is nailed

_____ 2. A small piece of trim at the top of the fascia, usually 3/4 inch by 1 1/2 inches, used to keep the moisture off the fascia

_____ 3. The member of a cornice that attaches the lookout to the wall

_____ 4. The cornice member that seals between the rafters and ceiling joists and covers the top edge of the siding

_____ 5. The trim around the ends of the rafters, including fascia, shingle mold, soffit, and frieze or brick mold

_____ 6. The bottom member of a cornice made of plywood that covers the rafters

_____ 7. The horizontal member of a cornice that is attached to the rafter tails

Completion of this assignment sheet partially fulfills competency B-9 of Building Maintenance.

ANSWERS TO ASSIGNMENT SHEET 1

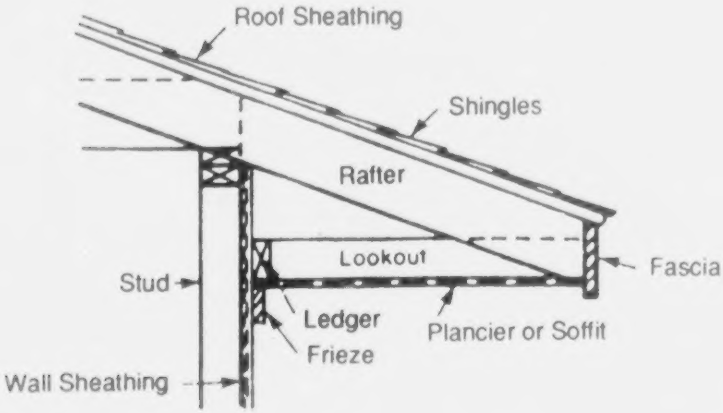
1. ab
2. c
3. ac
4. e
5. a
6. d
7. b

REPAIRING FASCIA AND SOFFIT OF CLOSED OR BOXED CORNICE ON A GABLE ROOF

Equipment:

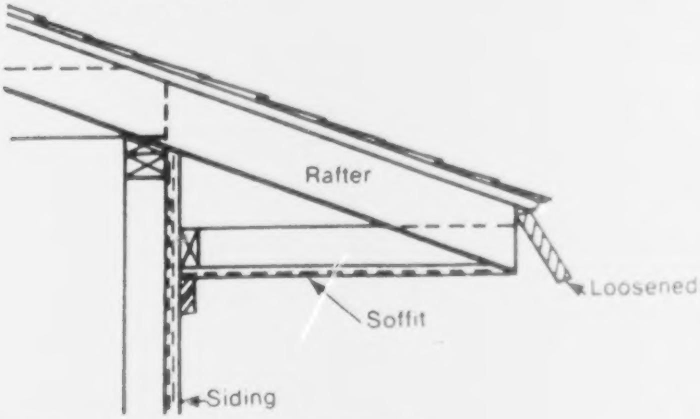
Framing square
Steel tape
13 oz. claw hammer
Handsaw or portable power saw
Sawhorses
Nails
Replacement material for fascia
Replacement material for frieze
Nail bar
Pencil
Try square
Caulk and caulking gun
Plywood for soffit
Eye protection

Procedure:	Evaluation 3 2 1 N
A. Repairing soffit	
1. Remove the frieze board, being careful not to damage it if it can be reused.	__ __ __ __


Roof Sheathing
Shingles
Rafter
Lookout
Fascia
Stud
Ledger
Frieze
Plancier or Soffit
Wall Sheathing

2. Remove the damaged soffit, being careful not to damage the siding or fascia ___ ___ ___ ___

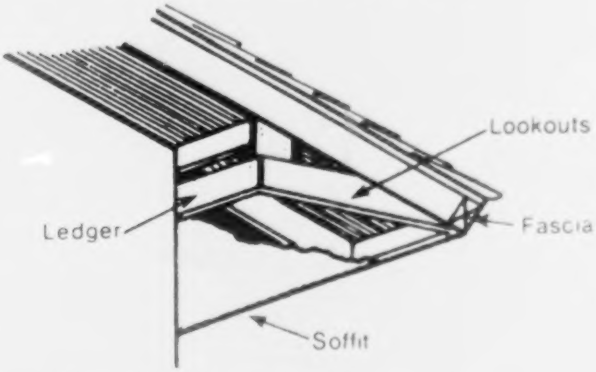
(Note: Fascia may have to be pulled loose a little to aid in the removal of the soffit)


Rafter
Loosened
Soffit
Siding

3. Cut the replacement plywood to the correct width and length for the soffit ___ ___ ___ ___

4. Nail the soffit in place ___ ___ ___ ___

(Note: Be sure the soffit is flush with the outside edge of the fascia)


Lookouts
Ledger
Fascia
Soffit

5. Nail the fascia back in place ___ ___ ___ ___

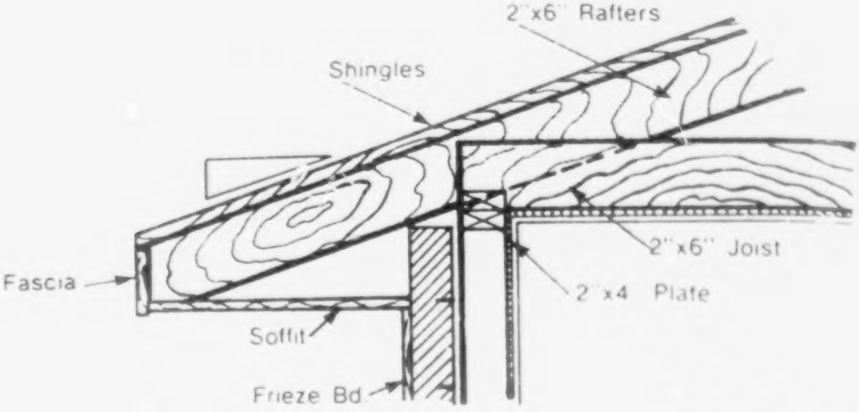
6. Nail frieze board back in place ___ ___ ___ ___

7. Re-caulk the soffit, fascia, and frieze ___ ___ ___ ___

8. Clean up work area and pick up tools ___ ___ ___ ___

B. Repairing fascia

1. Remove the damaged fascia board, being careful not to damage drip edge, soffit, and roofing material. __ __ __ __


2"x6" Rafters
Shingles
Fascia
2"x6" Joist
2"x4 Plate
Soffit
Frieze Bd

2. Cut the replacement material to the correct length. __ __ __ __

3. Nail replacement fascia board. __ __ __ __

4. Re-caulk fascia and soffit. __ __ __ __

5. Have instructor check your work.

6. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials. __ __ __ __

Average of above evaluations* __ __ __ __

*This average is the student's partial evaluation for competency B-9 of Building Materials.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 8: REPAIRING EXTERIOR TRIM

LESSON TEST

Part 1. Match the terms associated with exterior trim below to their correct definitions by placing the letter of the correct term in the blanks on the left.

a. Lookout
b. Soffit
c. Frieze mold
d. Ledger
e. Cornice
ab. Fascia
ac. Shingle mold

______ 1. The trim around the ends of the rafters including fascia, shingle mold, soffit, and frieze or brick mold

______ 2. The horizontal member of a cornice that is attached to the rafter tails

______ 3. A small piece of trim at the top of the fascia, usually 3/4 inch by 1 1/2 inches, used to keep moisture off the fascia

______ 4. The bottom member of a cornice made of plywood that covers the rafters

______ 5. The cornice member that seals between the rafters and ceiling joists and covers the top edge of the siding

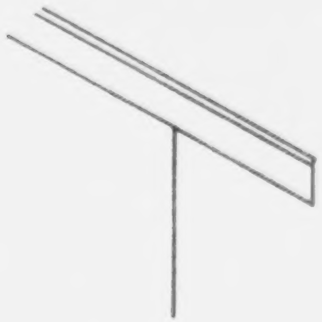
______ 6. The member of a closed cornice to which the soffit is nailed

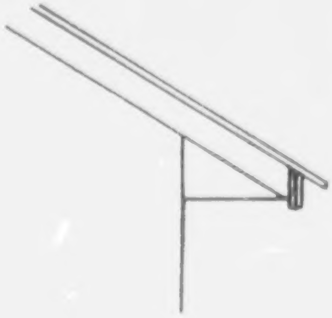
______ 7. The member of a cornice that attaches the lookout to the wall

Part 2. Identify the two types of cornices used in construction by placing the letter of the correct term in the blank beneath the picture.

A. Open

B. Closed or boxed



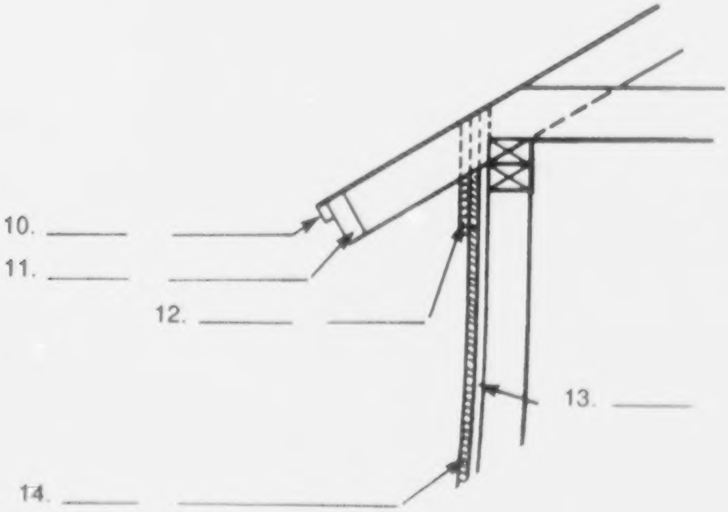


8. ______________________

9. ______________________

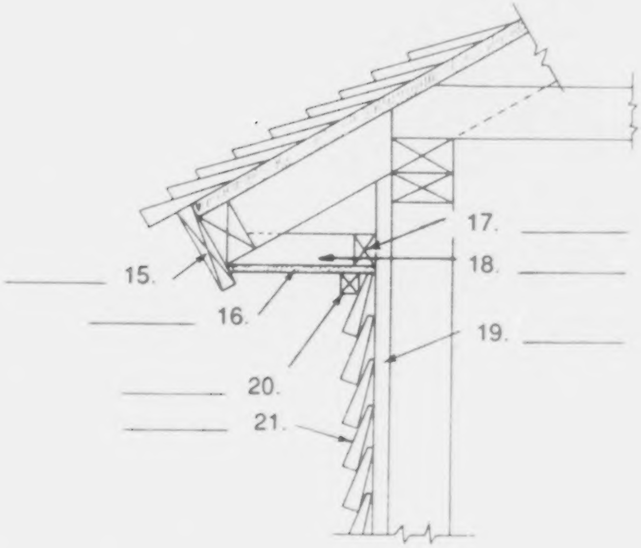
Part 3. Identify the parts of an open cornice by writing the correct letter from the list below in the correct blank.

a. Sub covering
b. Fascia
c. Frieze
d. Siding
e. Shingle mold



Part 4. Identify each of the parts of a box cornice by writing the correct letters from the list below on the correct blanks.

a. Soffit
b. Fascia
c. Ledger
d. Lookout
e. Frieze
ab. Siding
ac. Sub covering



MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT I, LESSON 8 TEST

Part 1.

1. e
2. ab
3. ac
4. b
5. c
6. a
7. d

Part 2.

8. a
9. b

Part 3.

10. d
11. b
12. c
13. a
14. e

Part 4.

15. b
16. a
17. c
18. d
19. ac
20. e
21. ab

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 9: REPAIRING ROOF FLASHING

LESSON OBJECTIVE

After completion of this lesson, the student will KNOW WHERE TO USE ROOF FLASHING AND THE STEPS OF INSTALLATION. Mastery will be evidenced by scoring____________percent on the lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Identify where flashing is used.
2. Know what materials are used in flashing.
3. Identify the steps in installing flashing.

Completion of the requirements of this lesson fulfills competency B-10 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 9: REPAIRING ROOF FLASHING

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Transparency master
   1. Flashing

D. Lesson test

E. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 9: REPAIRING ROOF FLASHING

INFORMATION OUTLINE

I. Terms and definitions

   A. Flashing--a sheet metal, plastic or lead shield used in roofing construction for protection from water seepage around vents, chimneys and roof edges

II. Composition of flashing

   A. Galvanized iron
      1. Preformed
      2. Roll

   B. Copper

   C. Aluminum

III. Uses of flashing

   A. In valleys

   B. Around chimneys

   C. On roof saddle or cricket

   D. Over vents

   (Note: Do not nail down until shingles have been nailed in place under bottom half of flashing)

IV. Procedure for installing flashing

   A. Cover area to be flashed with building paper

   B. Unroll flashing material

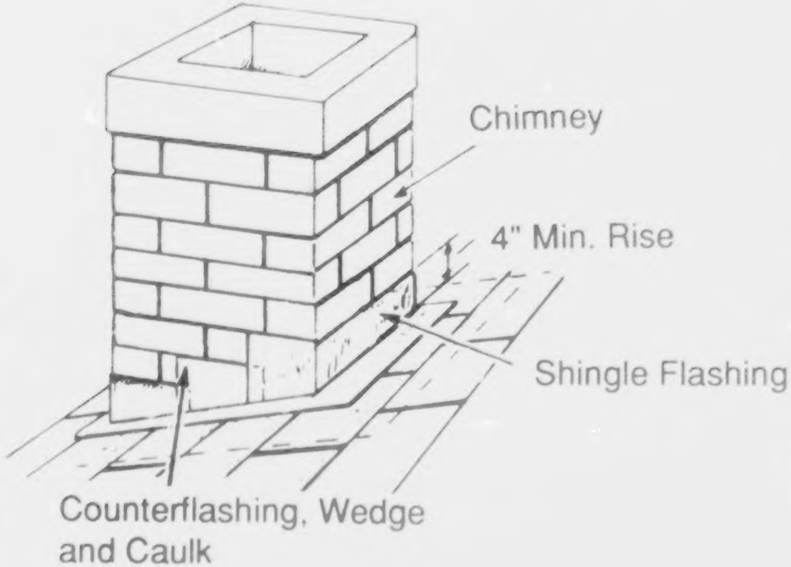
   C. Measure and cut to length

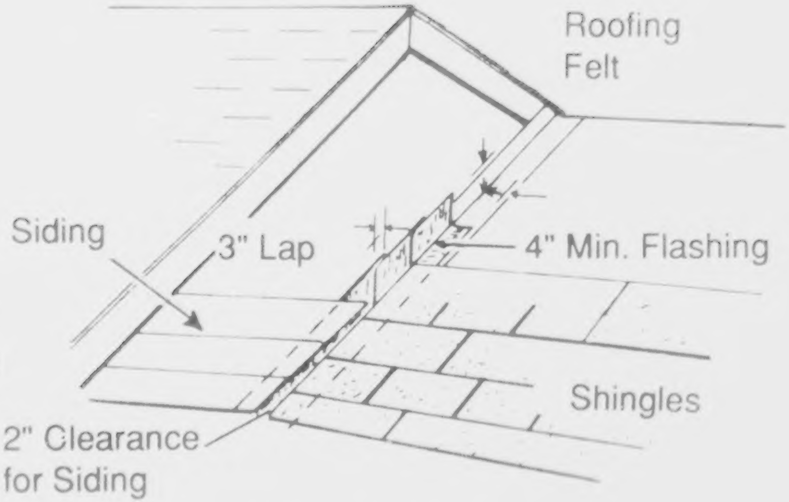
   D. Fit into valley or area needing flashing

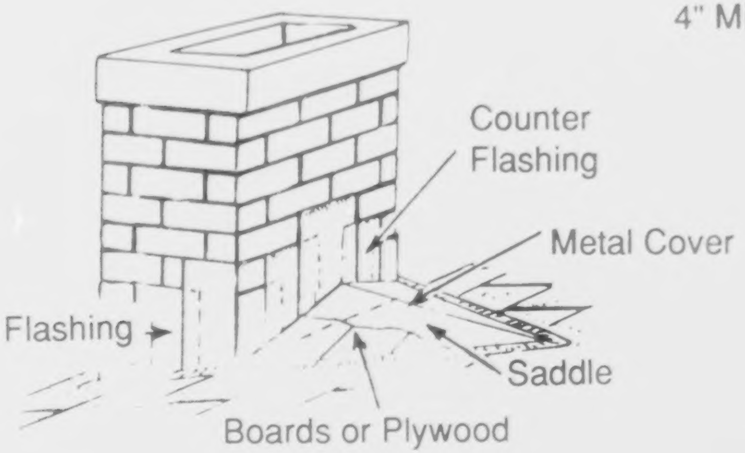
   E. Place nail approximately 1 inch from outer edge

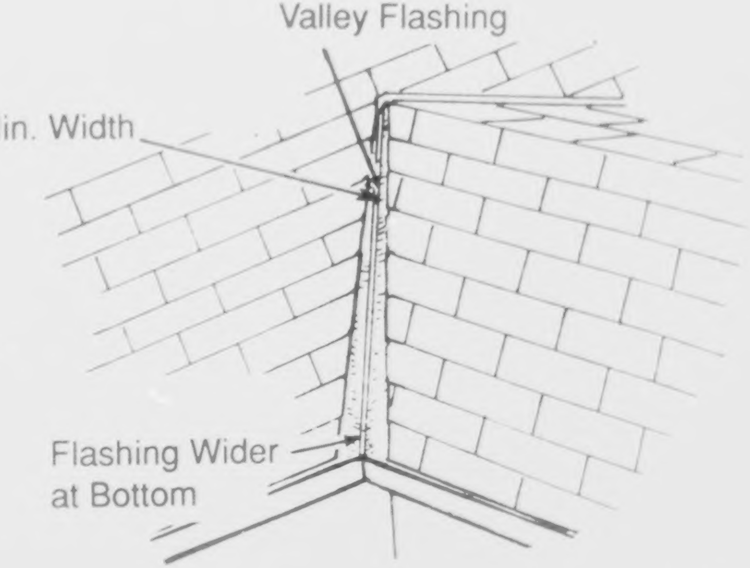
   F. Nail in place

Flashing


Chimney
4" Min. Rise
Shingle Flashing
Counterflashing, Wedge and Caulk


Roofing Felt
Siding
3" Lap
4" Min. Flashing
Shingles
2" Clearance for Siding


Counter Flashing
Metal Cover
Flashing
Saddle
Boards or Plywood


Valley Flashing
4" Min. Width
Flashing Wider at Bottom

CFP 167

TM 1

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 9: REPAIRING ROOF FLASHING

LESSON TEST

Part 1. List the steps of procedure for installing flashing by placing the letters in correct order.

A. Place nail approximately 1 inch from outer edge

B. Cover area to be flashed with building paper

C. Nail in place

D. Unroll flashing material

E. Fit into valley or area needing flashing

AB. Measure and cut to length

______ 1.

______ 2.

______ 3.

______ 4.

______ 5.

______ 6.

Part 2. Which of the following materials are used for flashing? (More than one answer.)

A. Asphalt
B. Copper
C. Aluminum
D. Paper
E. Galvanized iron
AB. Wood

______________________________ 7.

Part 3. In which of the following roof locations is flashing used? (More than one answer.)

A. Chimneys
B. Valleys
C. Vents
D. Ridge row
E. Roof saddle
AB. Flat roof

______________________________ 8.

MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT I, LESSON 9 TEST

Part 1.

1. b
2. d
3. ab
4. e
5. a
6. c

Part 2.

7. b, c, e

Part 3.

8. a, b, c, e

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 10: REPAIR/REPLACE ROOF SHINGLES

LESSON OBJECTIVE

After completion of this lesson, the student will be able to, IDENTIFY PARTS OF A ROOF, MATERIALS AND PROCEDURES FOR REPAIRING/REPLACING SHINGLES. **Mastery** will be evidenced by satisfactory completion of assignment sheets and by scoring ___________ percent on the lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Identify components of a roof.
2. Name four types of roofs.
3. Identify roof fasteners for shingles.
4. Choose correct statements concerning roofing methods and materials.

Completion of the requirements of this lesson fulfills competency B-11 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 10: REPAIR/REPLACE ROOF SHINGLES

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Transparency masters
    1. Roofing materials (standard wood shingles)
    2. Roofing materials (shakes and junior shakes)
    3. Roofing materials (asphalt shingles)
    4. Roofing fasteners
    5. Building Paper
    6. Identification of roof members
    7. Roof styles

D. Handouts
    1. Identification of roof members
    2. Roof styles

E. Assignment sheets
    1. Identification of roof members
    2. Roof styles

F. Answers to assignment sheets

G. Lesson test

H. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 10: REPAIR/REPLACE ROOF SHINGLES

INFORMATION OUTLINE

I. Terms and definitions

A. Building paper--an inexpensive, thick asphalt impregnated paper used to insulate a building before the siding or roofing is put on

B. Exposure--the surface area of a shingle not covered by another shingle

C. Flashing--sheet metal or other material used around dormers, chimneys and valleys to protect a building from seepage of water

D. Square--a unit of measure consisting of 100 square feet of area

E. Shingle--a covering applied in overlapping layers; the most commonly used are made of wood and asphalt

F. Saddle--a small gable roof placed behind a chimney on a sloping roof to direct water around the chimney

G. Rake--trim members that run parallel to the roof slope and form the finish between the roof and wall at a gable end

H. Toplap--the width of the shingles minus the exposure

I. Shingle butt--the lower exposed edge of the shingle

J. Roof sheathing--material placed over the exterior rafters of a structure; provides a base for the attachment of shingles

K. Roof--the covering or upper part of a building

L. Roll roofing--any roofing material that comes in continuous rolls of different lengths

M. Built-up roof--a roof made with three, four or five plies of felt

N. Drip edge--flashing used to prevent damage caused by ice dams

O. Roof covering--the outer layer of roof--it keeps out the elements, such as rain and snow, and provides protection against wind and dust

II. Types and grades of roofing material (TM 1, TM 2, TM 3, TM 4, TM 5)

A. Wood
  1. Application--suitable for all applications except for a flat and very low-pitch roof
  2. Grades--(red cedar)
    a. No. 1
      1) Heartwood
      2) Clear
      3) Edge grain
    b. No. 2
      1) Flat grain
      2) Limited sapwood
      3) 60 percent
    c. No. 3
      1) Utility grade for economy applications
      2) 90 percent clear
  3. Types
    a. Standard shingles
    b. Shakes
    c. Junior shakes

    (Note: All wood shingles and shakes are packaged four bundles per square in lengths of 16, 18 and 24 inches)

B. Composition
  1. Application--suitable for all applications except flat roofs, may be used on roof of lower pitch than wood shingles
  2. Grades

    (Note: Asphalt shingles are graded by their weight per square of coverage)

    a. 300 pounds
    b. 265 pounds
    c. 240 pounds
  3. Types

    (Note: All asphalt shingles are packaged three bundles per square)

    a. Three tab strip
    b. Lock tab

- C. Roofing fasteners
    - 1. Nails
        - a. Galvanized box nails (for wood shingles)
        - b. Galvanized roofing nails (for asphalt shingles)
    - 2. Staples--used in pneumatic staplers on wood and asphalt
- D. Building paper
    - 1. Composition--a heavy felt impregnated with asphalt
    - 2. Specification
        - a. Usually in rolls 36-inches wide
        - b. Most common weights are 15 and 20 pounds
    - 3. Uses
        - a. Insulation on roofs
        - b. Vapor barrier on roofs
        - c. Additional means of shedding water from a roof

III. Components of the roof (TM 6)

- A. Ridge
- B. Hip
- C. Dormer
- D. Rake
- E. Eave
- F. Chimney saddle or cricket
- G. Sheathing
- H. Valley

IV. Types of roofs (TM 7)

A. Hip roof--a roof that slopes up toward the center from all sides, necessitating a hip rafter at each corner

B. Mansard roof--a roof having two pitches on all sides with the lower slope steeper than the upper one

C. Gable roof--a double sloping roof that forms a gable at each end

D. Flat roof--a roof without slope or pitch

E. Shed or lean-to roof--a roof having only one slope or pitch

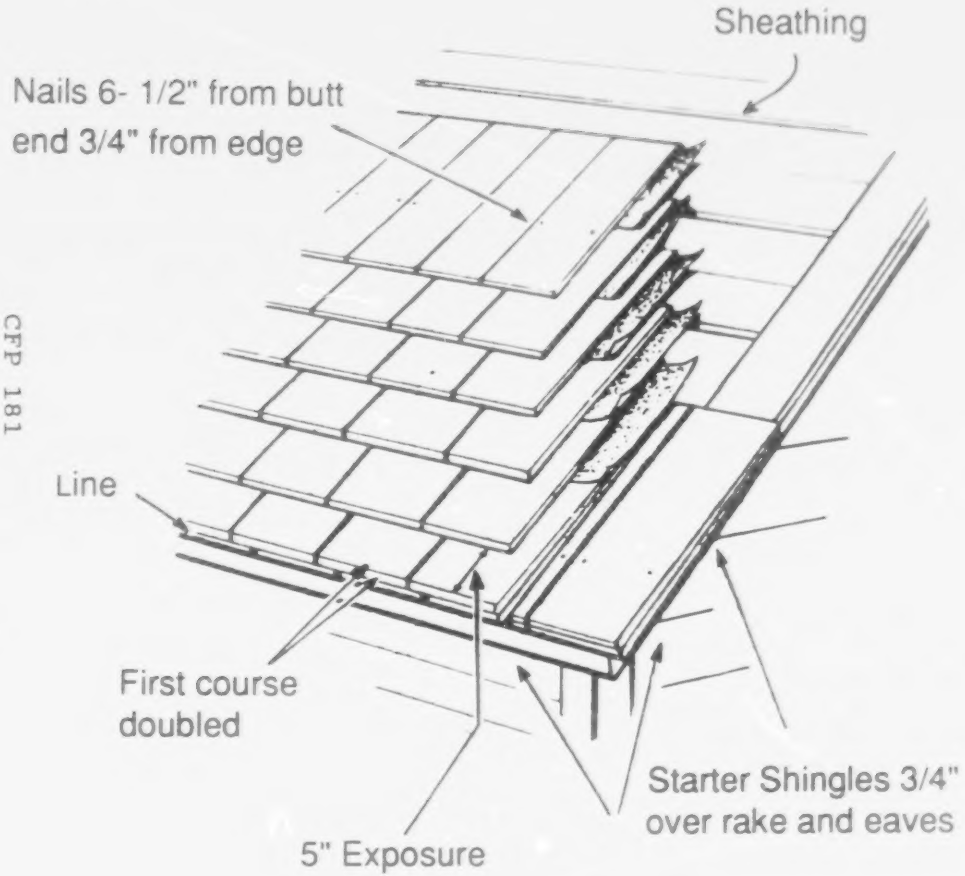
F. Gambrel roof--a roof having two pitches with the lower slope steeper than the upper slope

V. Roofing fasteners for shingles

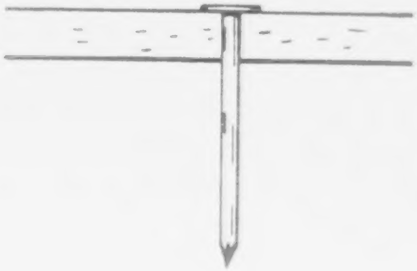
A. Wood shingles
   1. Galvanized box nails
   2. Staples

B. Asphalt shingles
   1. Galvanized roofing nails
   2. Staples

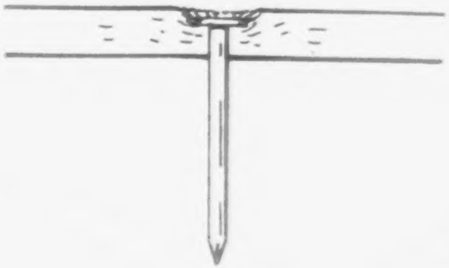
Roofing Materials
(Standard Wood Shingles)


Sheathing
Nails 6- 1/2" from butt end 3/4" from edge
Line
First course doubled
5" Exposure
Starter Shingles 3/4" over rake and eaves

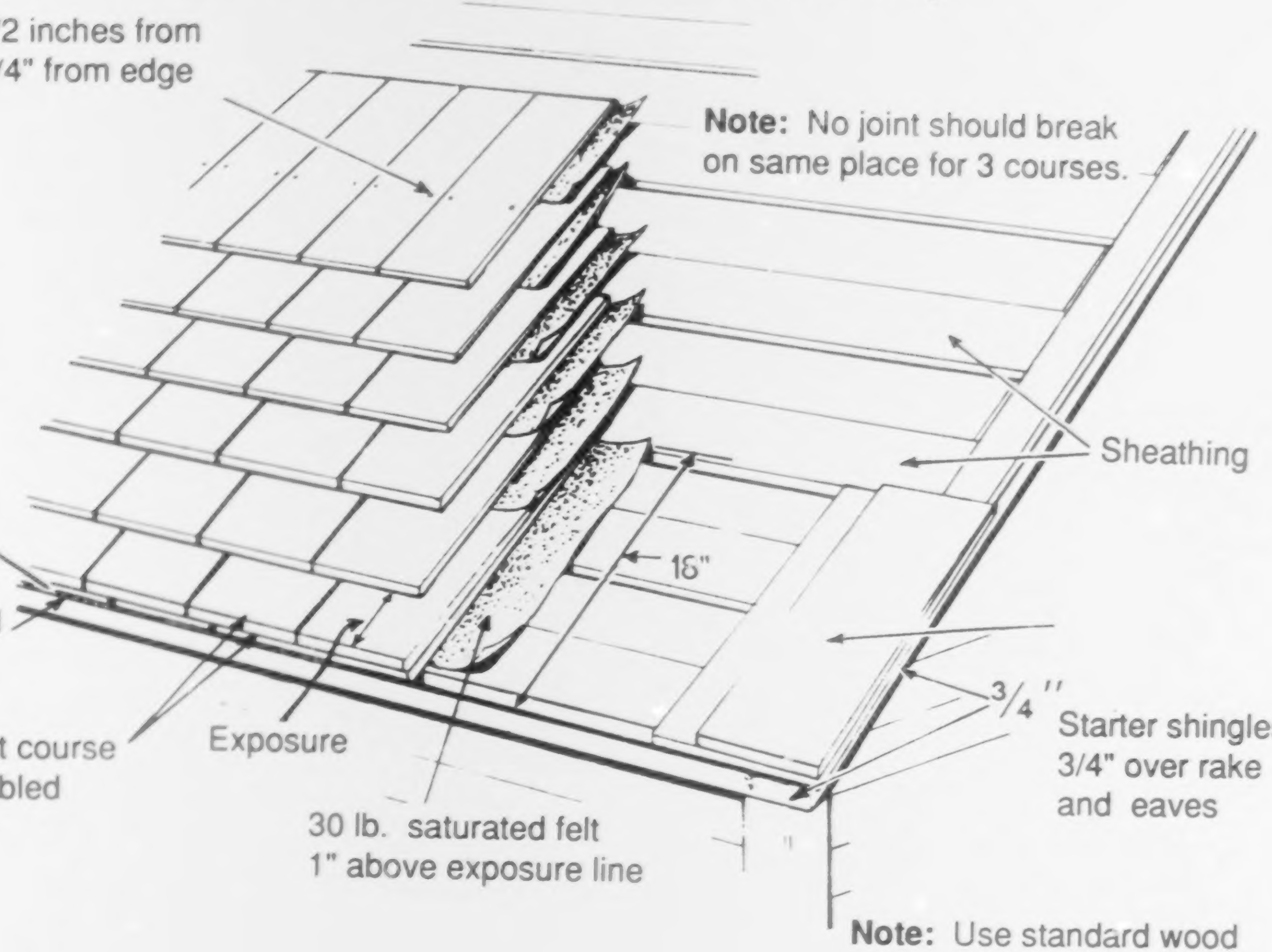
Do not hit the nail after the head is flush with the face of the shingle.



Do not crush the wood around the nail!



Roofing Materials (Shakes and Junior Shakes)



Nails 11 1/2 inches from butt end 3/4" from edge

Note: No joint should break on same place for 3 courses.

First course doubled

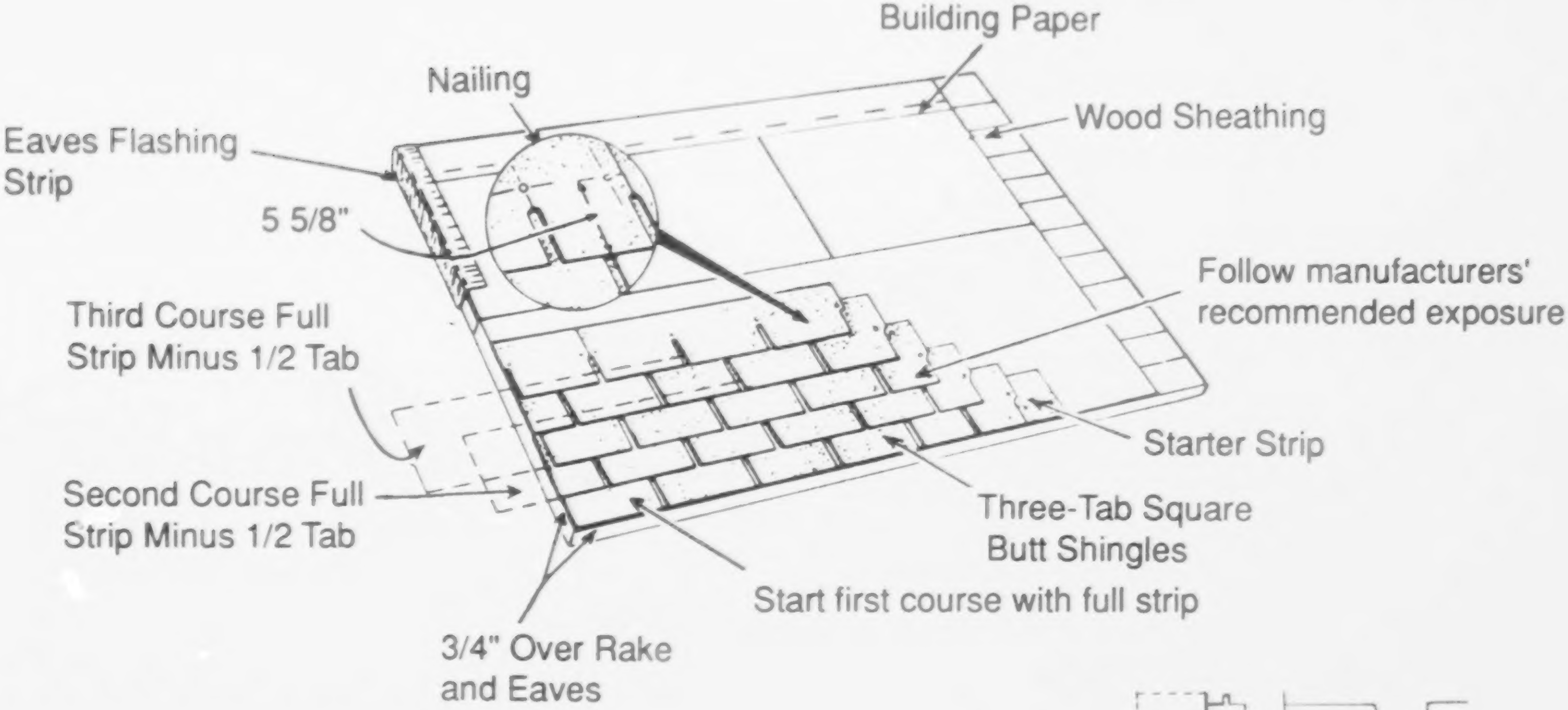
Exposure

30 lb. saturated felt 1" above exposure line

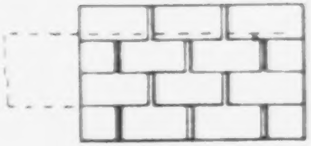
Starter shingles 3/4" over rake and eaves

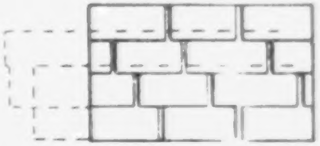
Note: Use standard wood shingles in first starter course.

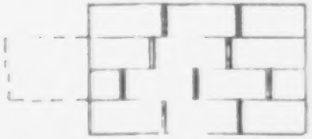
Roofing Materials (Asphalt Shingles)

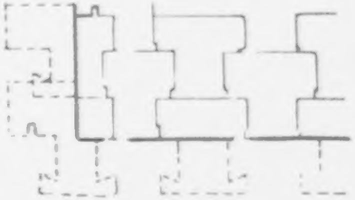

Building Paper
Nailing
Wood Sheathing
Eaves Flashing Strip
5 5/8"
Follow manufacturers' recommended exposure
Third Course Full Strip Minus 1/2 Tab
Starter Strip
Second Course Full Strip Minus 1/2 Tab
Three-Tab Square Butt Shingles
Start first course with full strip
3/4" Over Rake and Eaves

CFP 185


1/2 Break Tab


1/3 Break 3 Tab

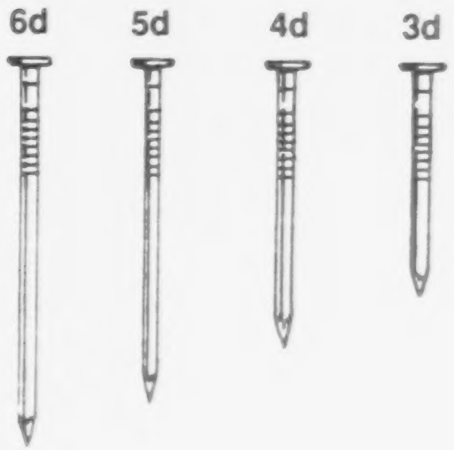

5" Break 3 Tab

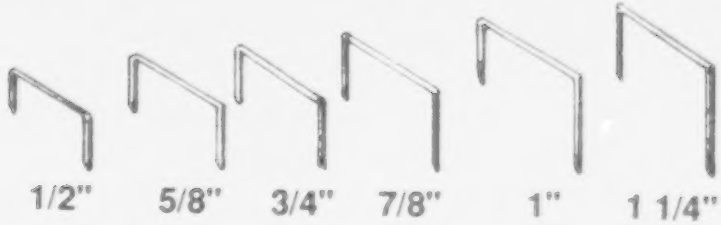

Lock Tab

TM 3

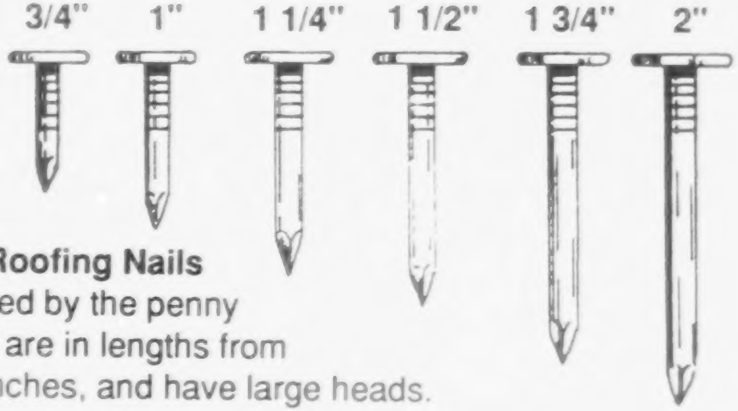
Roofing Fasteners

Galvanized Box Nails
(Shingler nails) are sized from 3d to 6d. They are used for cedar shingles.



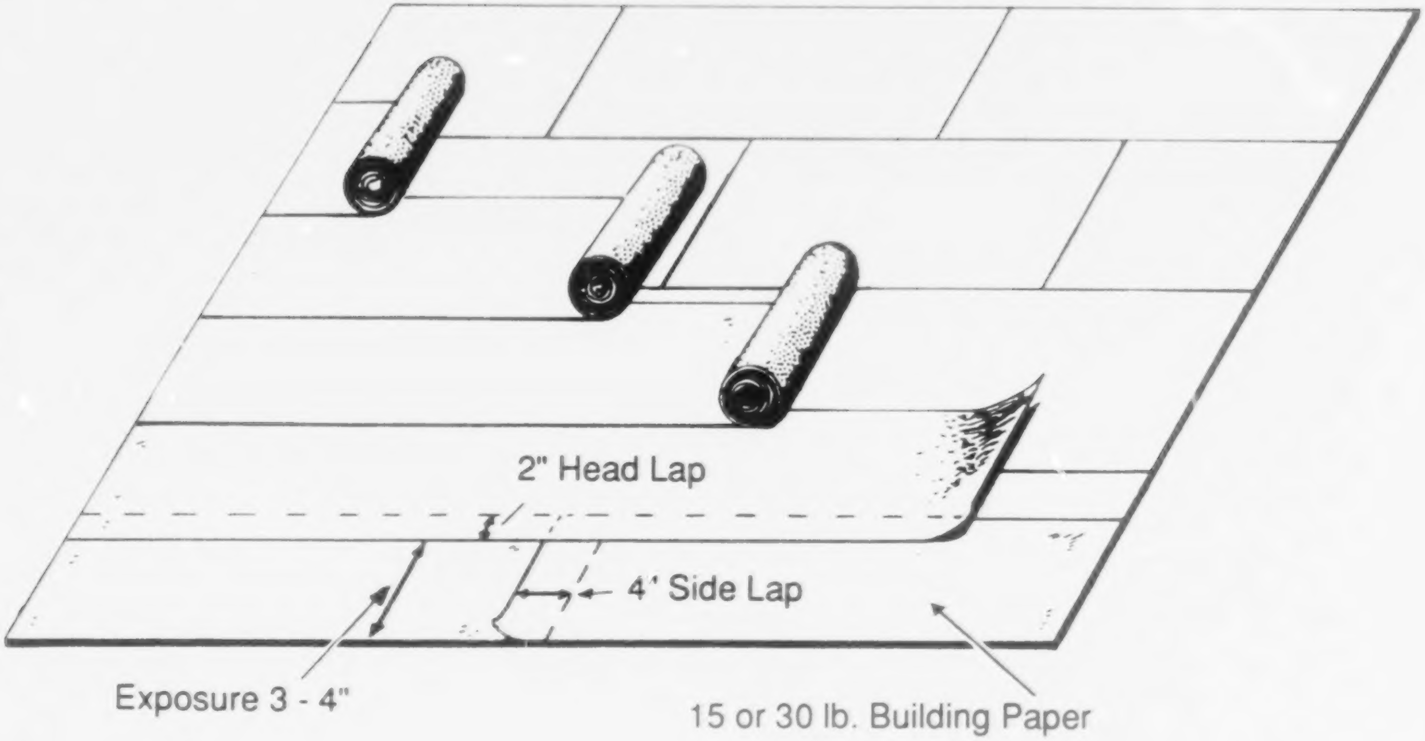

1/2"
5/8"
3/4"
7/8"
1"
1 1/4"

Staples
The wide crown staples have a 1 inch crown and vary in length from 1/2 - 1 1/4 inch.


3/4"
1"
1 1/4"
1 1/2"
1 3/4"
2"

Galvanized Roofing Nails
are not specified by the penny system. They are in lengths from 3/4 inch to 2 inches, and have large heads.

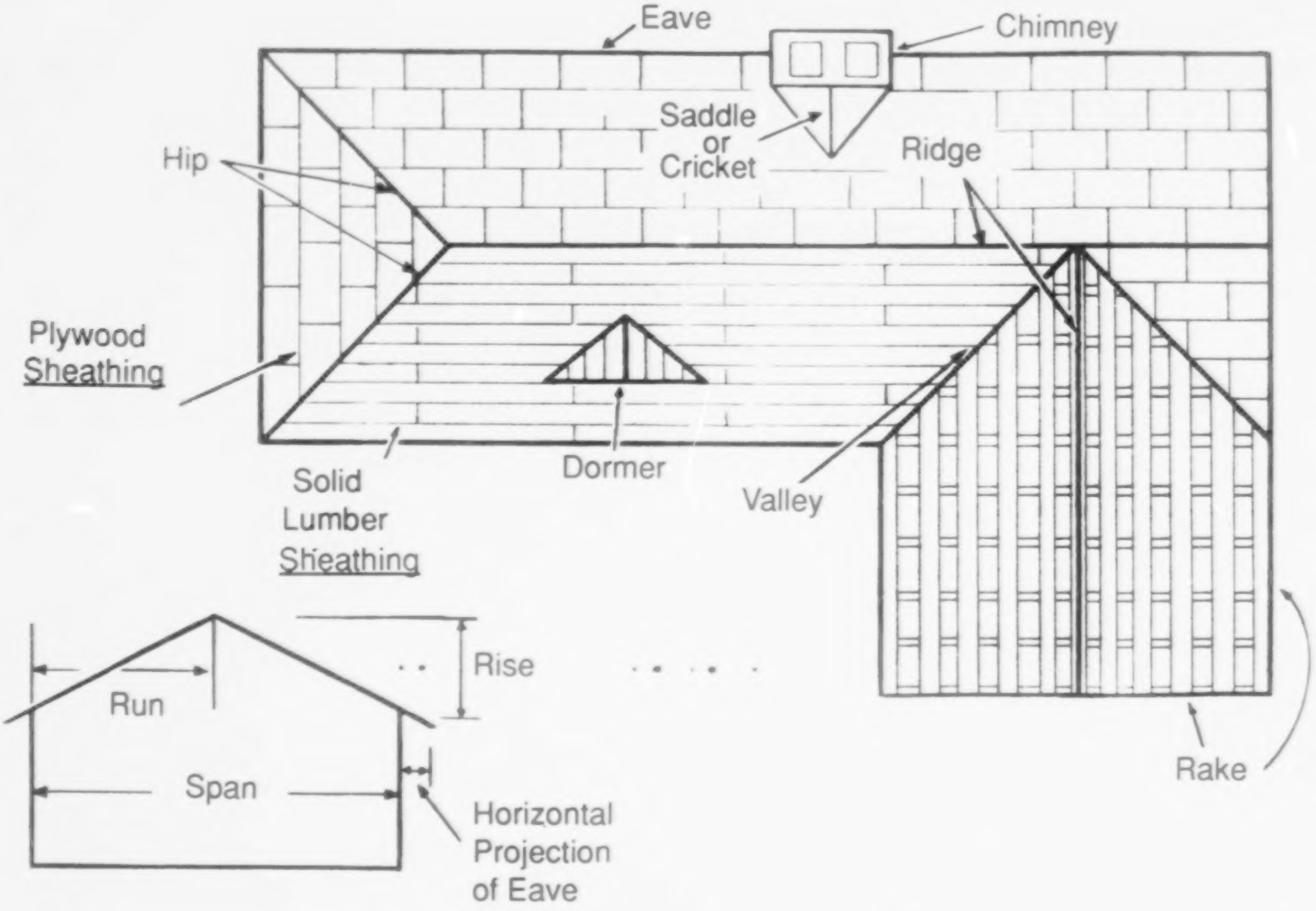
Building Paper


2" Head Lap
4' Side Lap
Exposure 3 - 4"
15 or 30 lb. Building Paper

CFP 189

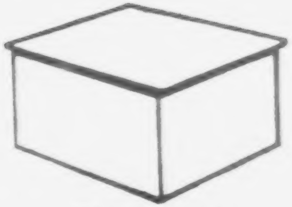
TM 5

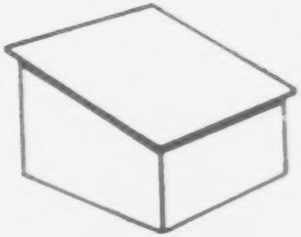
Identification of Roof Members

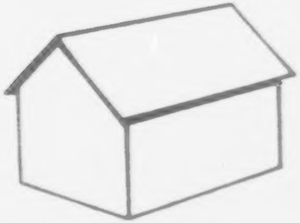

Eave
Chimney
Saddle or Cricket
Ridge
Hip
Plywood Sheathing
Solid Lumber Sheathing
Dormer
Valley
Rake
Run
Rise
Span
Horizontal Projection of Eave

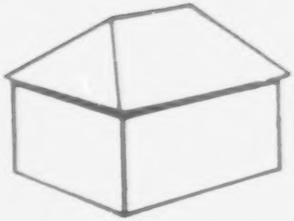
CFP 191

Roof Styles

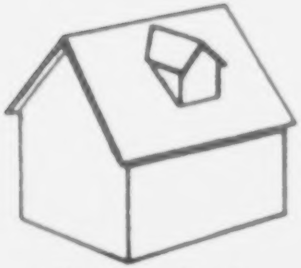

Flat Roof

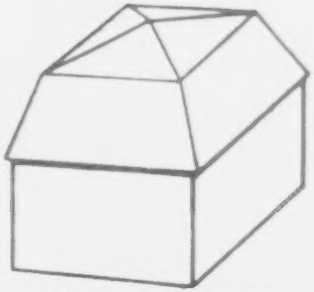

Shed or
Lean-to Roof

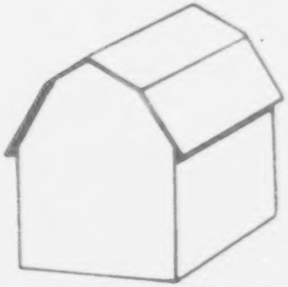

Gable Roof


Hip Roof

CFP 193

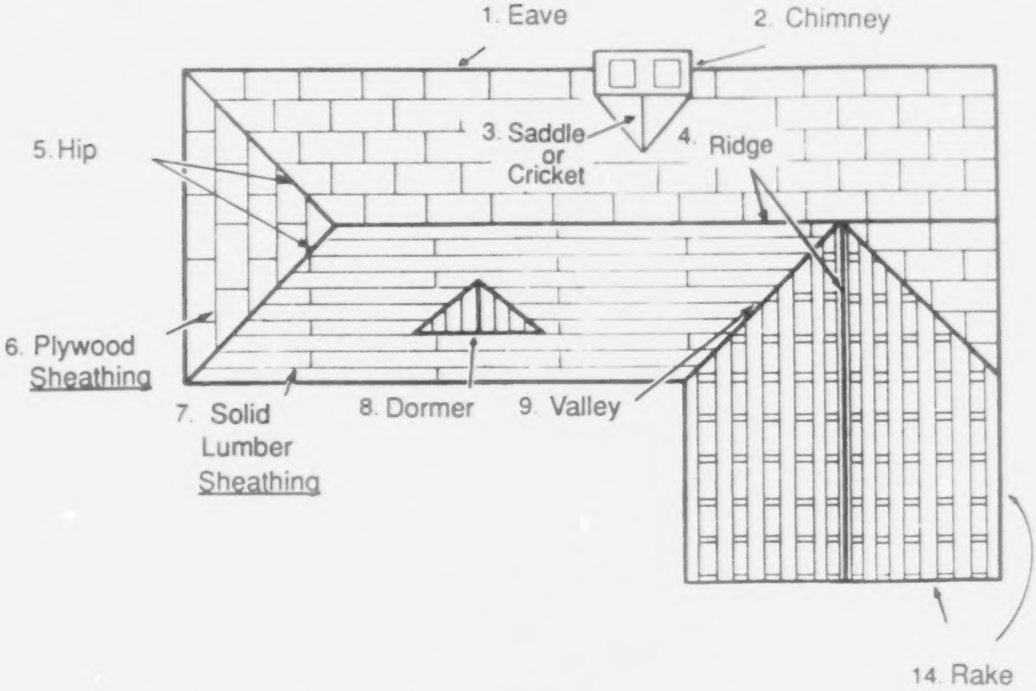

Gable Roof
and Dormer

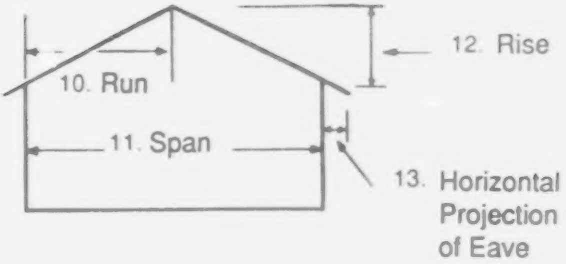

Mansard Roof


Gambrel Roof

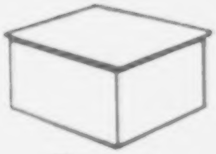
TM 7

IDENTIFICATION OF ROOF MEMBERS

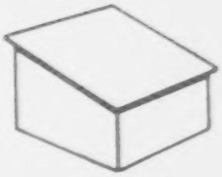

1. Eave
2. Chimney
3. Saddle or Cricket
4. Ridge
5. Hip
6. Plywood Sheathing
7. Solid Lumber Sheathing
8. Dormer
9. Valley
14. Rake


10. Run
11. Span
12. Rise
13. Horizontal Projection of Eave

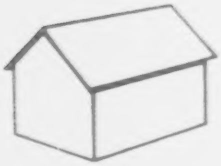
ROOF STYLES



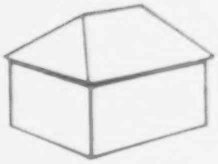
Flat Roof



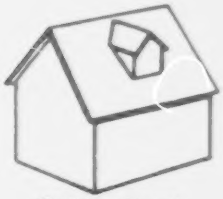
Shed or
Lean-to Roof



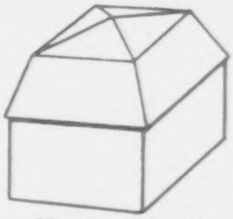
Gable Roof



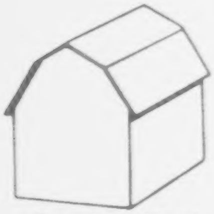
Hip Roof



Gable Roof
and Dormer



Mansard Roof



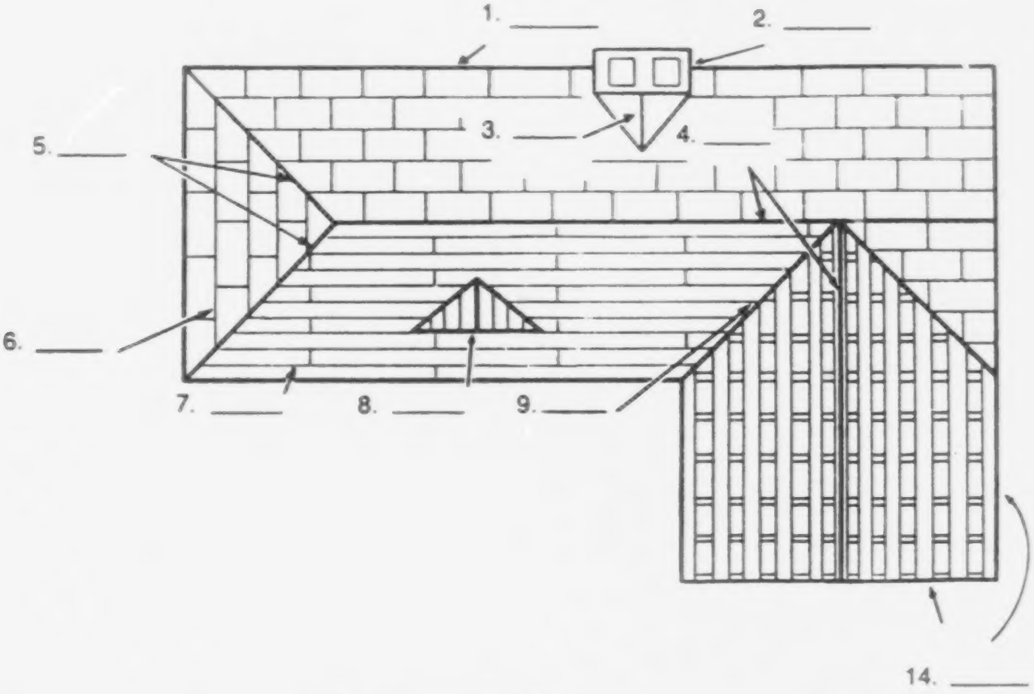
Gambrel Roof

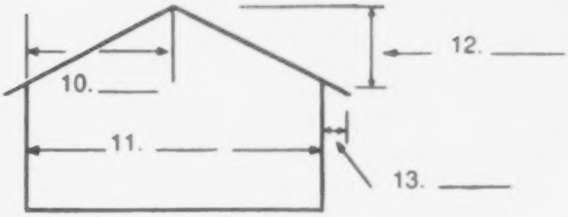
IDENTIFICATION OF ROOF MEMBERS

Directions: Identify roof members on the drawing by writing the letter for the term in the appropriate blank.

A. Eave
B. Saddle or cricket
C. Hip
D. Plywood sheathing
E. Dormer
AB. Rise
AC. Span

AD. Run
AE. Valley
BC. Solid lumber sheathing
BD. Ridge
BE. Chimney
CC. Rake
CD. Horizontal project of eave

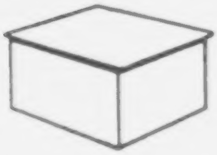




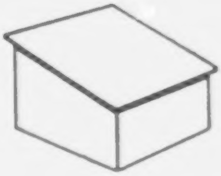
ROOF STYLES

Directions: Identify each roof type on the drawing by writing the letter for the term in the appropriate blank.

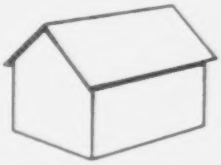
A. Mansard roof
B. Hip roof
C. Flat roof
D. Gambrel roof
E. Gable Roof
AB. Shed or lean-to roof
AC. Gable roof and dormer



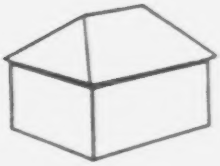
1. ____________



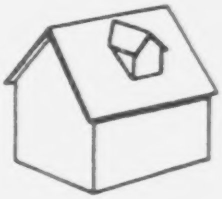
2. ____________



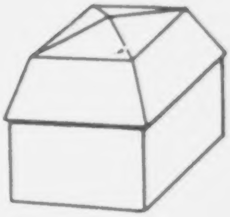
3. ____________



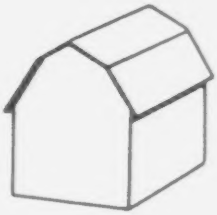
4. ____________



5. ____________



6. ____________



7. ____________

ANSWERS TO ASSIGNMENT SHEETS 1 - 2

Assignment Sheet 1.

1. A
2. BE
3. B
4. BD
5. C
6. D
7. BC
8. E
9. AE
10. AD
11. AC
12. AB
13. CD
14. CC

Assignment Sheet 2.

1. C
2. AB
3. E
4. B
5. AC
6. A
7. D

MODULE: CARPENTRY AND FINISHING PROCEDURES

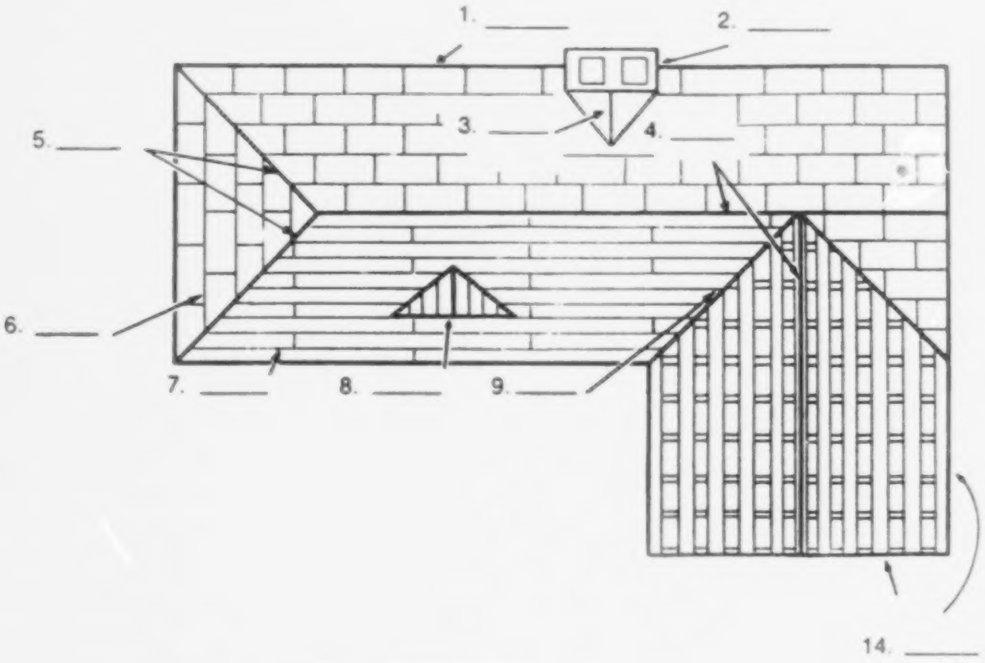
UNIT I: EXTERIOR CARPENTRY

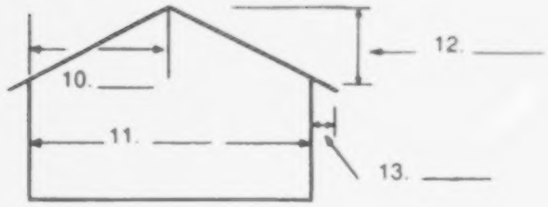
LESSON 10: REPAIR/REPLACE ROOF SHINGLES

LESSON TEST

Part 1. Identify roof members on the drawing by writing the letter for the term in the appropriate blank.

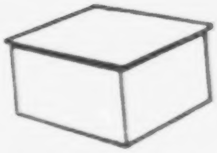
A. Eave
B. Saddle or cricket
C. Hip
D. Plywood sheathing
E. Dormer
AB. Rise
AC. Span
AD. Run
AE. Valley
BC. Solid lumber sheathing
BD. Ridge
BE. Chimney
CC. Rake
CD. Horizontal project of eave



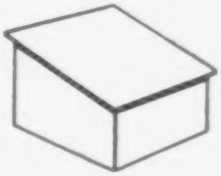


Part 2. Identify each roof type on the drawing by writing the letter for the term in the appropriate blank.

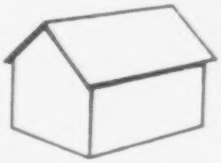
A. Mansard roof
B. Hip roof
C. Flat roof
D. Gambrel roof
E. Gable Roof
AB. Shed or lean-to roof
AC. Gable roof and dormer



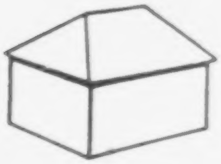
15. ____________



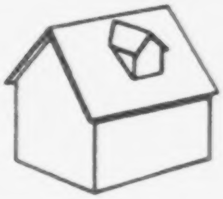
16. ____________



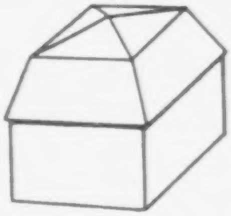
17. ____________



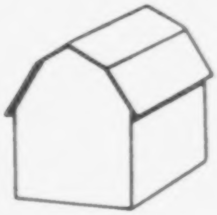
18. ____________



19. ____________



20. ____________



21. ____________

Part 3. Choose the letter of the correct response to each question and write it on the blank at the left.

______22. How many bundles of asphalt shingles come in each square?
A. 4 C. 1
B. 3 D. 2

______23. With what are wood shingles are fastened?
A. Finish nails C. Galvanized nails
B. Staples D. Box nails

______24. Rolled roofing should overlap
A. 2 inches C. 10 inches
B. 6 inches D. 4 inches

______25. What is a roof?
A. Side of a building C. Covering of a building
B. Floor of a building D. Outside of a building

______26. What are shingles?
A. Covering of the roof C. Floor covering
B. Siding D. Trim

Part 4. Choose the correct statements concerning roofing methods and materials by writing TRUE or FALSE on the blanks at the left.

______27. All wood shingles are packaged four bundles per square

______28. Asphalt shingles come in four weights

______29. Galvanized box nails are used for asphalt shingles

______30. There are three grades of red cedar shingles

______31. A square of shingles covers 150 square feet of area

______32. Galvanized nails come in several length and sizes

______33. A Gable roof is flat

______34. A shed or lean-to roof has only one slope or pitch

______35. Asphalt shingles have three tabs

______36. A flat roof is better than a pitched roof

MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT I, LESSON 10 TEST

Part 1.

1. A
2. BE
3. B
4. BD
5. C
6. D
7. BC
8. E
9. AE
10. AD
11. AC
12. AB
13. CD
14. CC

Part 2.

15. C
16. AB
17. E
18. B
19. AC
20. A
21. D

Part 3.

22. B
23. C
24. A
25. C
26. A

Part 4.

27. TRUE
28. FALSE
29. TRUE
30. TRUE
31. FALSE
32. TRUE
33. FALSE
34. TRUE
35. TRUE
36. FALSE

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 11: REPLACING DOWNSPOUTS AND GUTTERING

LESSON OBJECTIVE

After completion of this lesson, the student will be able to IDENTIFY PARTS OF DOWNSPOUTS AND GUTTERING AND INSTALL GUTTERS AND DOWNSPOUTS. Mastery will be evidenced by completion of job sheet and by scoring __________ percent on lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Identify and define terms associated with guttering and downspouts.
2. Identify sizes of gutters and downspouts.
3. List materials from which gutters are constructed.
4. Install gutters and downspouts.

Completion of the requirements of this lesson fulfills competency B-12 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 11: REPLACING DOWNSPOUTS AND GUTTERING

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Transparency master
    1. Parts of a gutter

D. Handout
    1. Parts of a gutter

E. Job sheet
    1. Installing gutters and downspouts

F. Lesson test

G. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 11: REPLACING DOWNSPOUTS AND GUTTERING

INFORMATION OUTLINE

I. Terms and definitions

- A. Gutter--controls roof drainage
- B. Downspout--carries water from gutter for discharge
- C. Miter joint--the joining of two pieces at an angle requiring a 45° cut on each piece (for a 90° corner)
- D. Joint connector--connects gutters at joints
- E. End cap--fits at end of gutter
- F. Outlet tube--receives water from gutter
- G. Troughs--collect rain water from the edge of the roof and carry it to downspouts

II. Gutter sizes

- A. 5-inch troughs
- B. 6-inch troughs

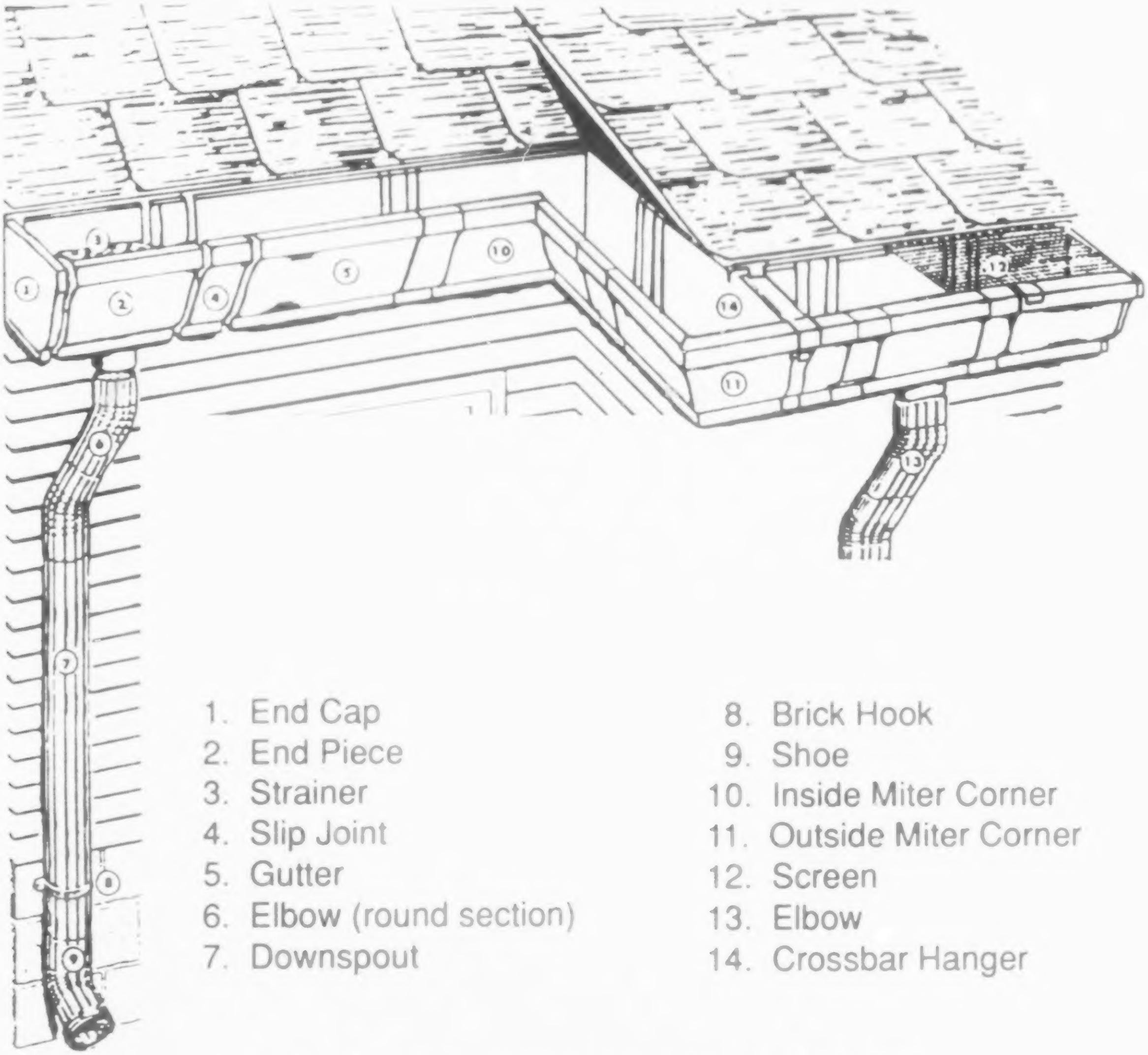
III. Downspout sizes

- A. 3-inch downspout
- B. 4-inch downspout

IV. Types of material used for gutters

- A. Galvanized sheet metal
- B. Wood
- C. Aluminum
- D. Stainless steel
- E. Vinyl

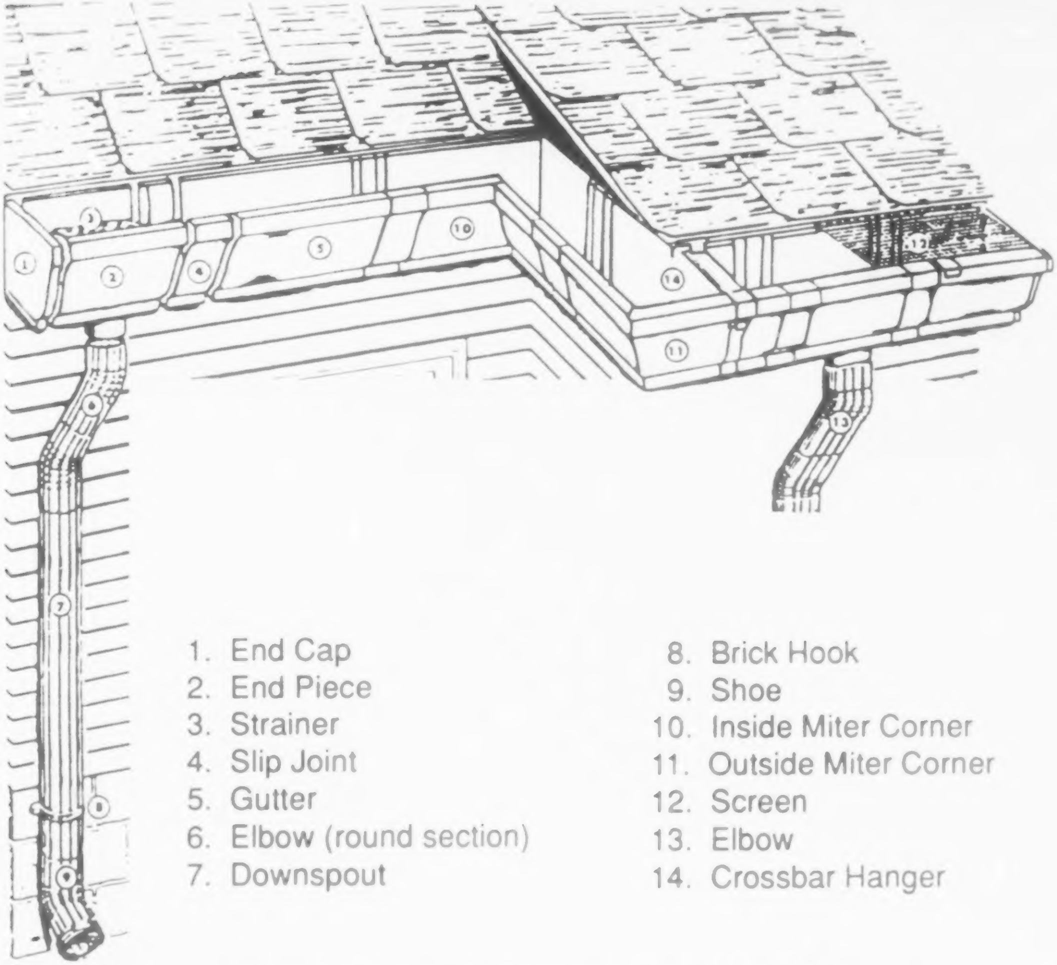
Parts of a Gutter



1. End Cap
2. End Piece
3. Strainer
4. Slip Joint
5. Gutter
6. Elbow (round section)
7. Downspout
8. Brick Hook
9. Shoe
10. Inside Miter Corner
11. Outside Miter Corner
12. Screen
13. Elbow
14. Crossbar Hanger

Gutters and downspouts are assembled from stock parts. They are fastened together with slip joints, pop rivets, metal screws, or by soldering.

PARTS OF A GUTTER



1. End Cap
2. End Piece
3. Strainer
4. Slip Joint
5. Gutter
6. Elbow (round section)
7. Downspout
8. Brick Hook
9. Shoe
10. Inside Miter Corner
11. Outside Miter Corner
12. Screen
13. Elbow
14. Crossbar Hanger

Gutters and downspouts are assembled from stock parts. They are fastened together with slip joints, pop rivets, metal screws, or by soldering.

JS 1

INSTALLING GUTTERS AND DOWNSPOUTS

Equipment:

Guttering material
Downspout material
Outside miter
Inside miter
End cap
Outlet tube
Tin snips
Screwdriver
Hook
Spikes
Electric drill
Elbow
Rivet gun
Hammer
Ladder
Hacksaw
Steel tape measure (50-foot)

Procedure:	Evaluation 3	2	1	N
1. Determine the size of gutters and downspouts	___	___	___	___
2. Measure the length of gutters.	___	___	___	___
3. Measure downspout opening for drainage of water.	___	___	___	___
4. Cut gutter to correct size.	___	___	___	___
5. Measure and cut downspout outlet for drainage.	___	___	___	___
6. Rivet and solder joints, end caps and outlets.	___	___	___	___
7. Hang and nail gutter to fascia board, making sure grade allows for drainage to downspout.	___	___	___	___
8. Hang and fit downspouts.	___	___	___	___
9. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials.	___	___	___	___
Average of above evaluations*	___	___	___	___

***This average is the student's partial evaluation for competency B-12 of Building Maintenance.**

MODULE: CARPENTRY AND FINISHING PROCEDURES

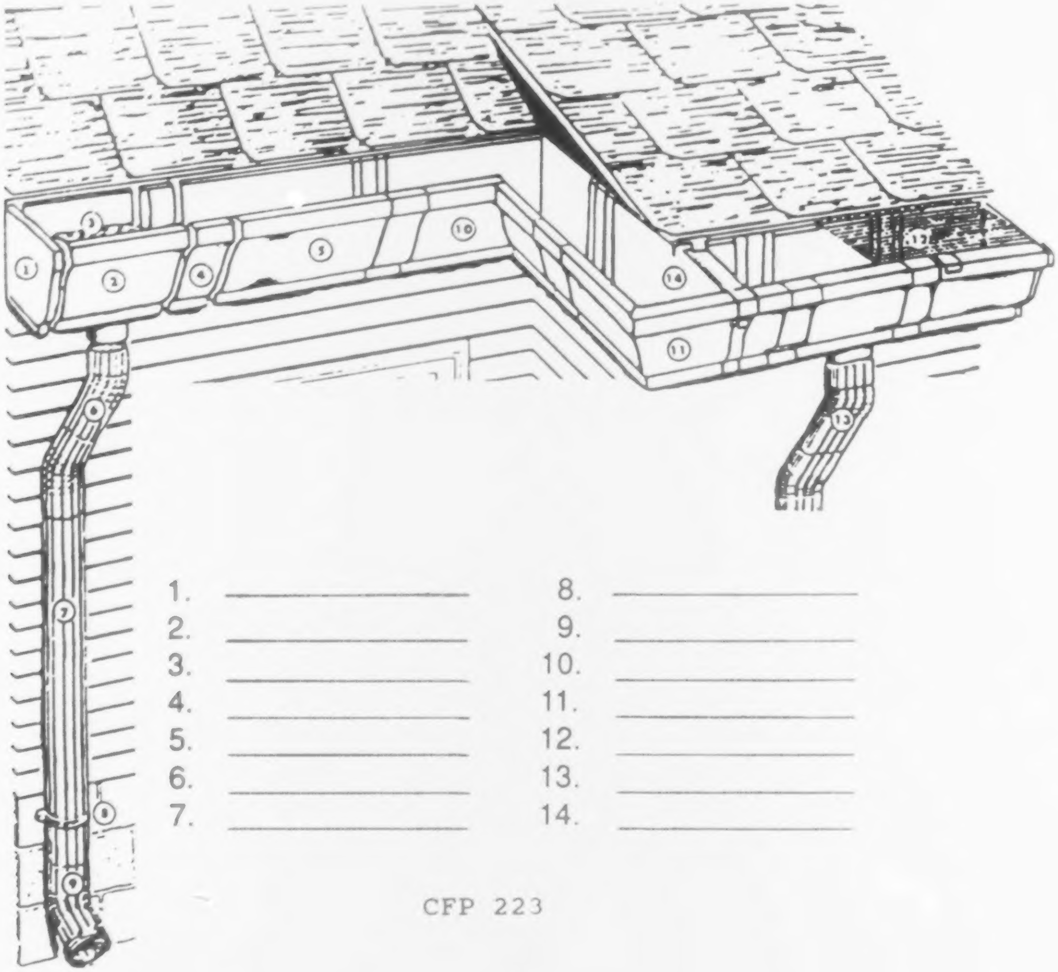
UNIT I: EXTERIOR CARPENTRY

LESSON 11: REPLACING DOWNSPOUTS AND GUTTERING

LESSON TEST

Part 1. Identify parts of a gutter by writing the correct letter from the list below in the blank by the corresponding number in the picture.

A. Brick hook
B. Shoe
C. Inside miter corner
D. Outside miter corner
E. Screen
AB. Elbow (round section)
AC. Crossbar hanger
AD. End cap
AE. End piece
BC. Strainer
BD. Slip joint
BE. Gutter
CD. Elbow
CE. Downspout



1. ______________
2. ______________
3. ______________
4. ______________
5. ______________
6. ______________
7. ______________
8. ______________
9. ______________
10. ______________
11. ______________
12. ______________
13. ______________
14. ______________

Part 2. Match the terms on the left with their definitions by writing the correct letter from the list on the blanks.

______15.	End cap	A.	3" and 4"
______16.	Troughs	B.	5" and 6"
______17.	Downspout sizes	C.	Fit at end of gutter
______18.	Gutter sizes	D.	Carries water from gutter for discharge
______19.	Downspout		
		E.	Collect rain water from edge of roof

Part 3. Choose the correct answers (more than one) for each question below.

______20. What materials are used for gutters?
A. Sheet metal   C. Vinyl
B. Wood   D. Paper

______21. What tools are used for installing gutters?
A. Drill   B. Hacksaw
B. Hammer   C. Skill saw

MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT I, LESSON 11 TEST

Part 1.

1. AD
2. AE
3. BC
4. BD
5. BE
6. AB
7. CE
8. A
9. B
10. C
11. D
12. E
13. CD
14. AC

Part 2.

15. C
16. E
17. A
18. B
19. D

Part 3.

20. A, B, C
21. A, B, C

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 12: INSTALLING WEATHERPROOFING

LESSON OBJECTIVE

After completion of this lesson, the student will be able to INSTALL WEATHERPROOFING. Mastery will be evidenced by completion of job sheet.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Install weatherstripping around windows.
2. Install weatherstripping around exterior doors.
3. Weatherproof other areas of the house.

Completion of the requirements of this lesson fulfills competency B-13 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT I: EXTERIOR CARPENTRY

LESSON 12: INSTALLING WEATHERPROOFING

CONTENTS OF LESSON

A. Objectives

B. Job sheet
    1. Weatherproofing

WEATHERPROOFING

Equipment:

- Hammer
- Nail
- Weatherstripping
- Screwdriver
- Saw
- Chisel
- Door seal
- Threshold
- Caulking gun
- Utility knife
- Sealant
- Glazing compound

Procedure:

		Evaluation 3	 2	 1	 N
	Install weatherstripping around windows				
1.	Select weatherstripping.	___	___	___	___
2.	Measure the strips.	___	___	___	___
3.	Install bottom sash channel strips.	___	___	___	___
4.	Secure the channel strips.	___	___	___	___
5.	Tighten the seal.	___	___	___	___
6.	Install top and bottom cross strips.	___	___	___	___
7.	Install outer channel strips.	___	___	___	___
8.	Mount the center cross strip.	___	___	___	___
	Install weatherstripping around exterior doors				
9.	Select weatherstripping.	___	___	___	___
10.	Straighten a door.	___	___	___	___
11.	Install U-strip weatherstripping.	___	___	___	___
12.	Attach doorstop weatherstripping.	___	___	___	___
13.	Remove the existing threshold.	___	___	___	___
14.	Knock out end pieces.	___	___	___	___
15.	Install the new threshold.	___	___	___	___
16.	Attach plain door sweep.	___	___	___	___
17.	Attach a bottom sweep.	___	___	___	___

Weatherproof other areas of the house

18. Caulk around window and door frames. ____ ____ ____ ____

19. Weatherproof around lights and ceiling fans. ____ ____ ____ ____

20. Caulk around water and gas pipes. ____ ____ ____ ____

21. Apply glazing compound around window panes. ____ ____ ____ ____

22. Seal large cracks around foundation and wood construction. ____ ____ ____ ____

23. Apply rope-like caulking around cracks and other areas that leak air. ____ ____ ____ ____

Average of above evaluations* ____ ____ ____ ____

***This average is the student's evaluation for competency B-13 of Building Maintenance.**

UNIT II: INTERIOR CARPENTRY

LESSON 1: INTERIOR FINISHING

LESSON OBJECTIVE

After completion of this lesson, the student will be able to DEFINE TERMS ASSOCIATED WITH DRYWALL INSTALLATION and INSTALL DRYWALL. Mastery will be evidenced by satisfactory completion of job sheets and by scoring _____________ percent on the lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Know the standard sizes of drywall.
2. Know the different types of edges found on drywall.
3. Install drywall.

Completion of the requirements of this lesson fulfills competency E-2 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 1: INTERIOR FINISHING

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Transparency masters
  1. Shapes of gypsum wallboard
  2. Patterns for hanging wallboard
  3. Fastening and finishing materials

D. Job sheets
  1. Measure, cut and nail drywall
  2. Finish drywall

E. Lesson test

F. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 1: INTERIOR FINISHING

INFORMATION OUTLINE

I. Terms and definitions

   A. Backing--strips of wood nailed at the inside angles of walls and partitions to provide solid corners for nailing wallboard

   B. Dimple--the impression formed in the surface of gypsum wallboard when the nail is driven to the proper depth

   C. Drywall--a type of construction in which the interior finish material is something other than plaster, most commonly gypsum wallboard

   D. Gypsum board--modular panels from 1/4- to 5/8- inch thick, 4 feet wide and 6 to 16 feet long, composed of a core of gypsum sandwiched between two layers of paper

   E. Joint--the place where two pieces of wallboard meet

   F. Joint cement or compound--a specially prepared cement used to bond perfa-tape to gypsum wallboard at the joints

   G. Perfa-tape--perforated paper joint tape approximately 2 inches wide and in 60-, 250-, and 500-foot rolls

   H. Topping cement--specially prepared substance in heavy paste form used to cover the perfa-tape and fill in the joints

II. Standard sizes of drywall board (TM 1)

   A. Thickness
      1. 1/4-inch--used only when paneling is applied over it
      2. 3/8-inch--used only when paneling is applied over it
      3. 1/2-inch--used for single thickness only
      4. 5/8-inch--used where additional strength is required such as 24-inch O.C. studs and joists

   B. Width--4 feet

C. Length--comes in 8-, 10-, 12-, 14-, and 16-foot sections

(Note: Other sizes available on special order)

III. Edges--drywall is available with tapered or square edges

IV. Wall preparations--blocking or backing

A. Must be installed in all corner and ceiling areas to support edges of drywall

B. Blocking must be solid

V. Hanging patterns (TM 2)

A. Ceiling
1. Installed before walls
2. 1/2-inch material installed at right angle to joists
3. Nails placed approximately 6 inches apart and dimpled properly

(Note: Do not dimple enough to break paper on outside of wallboard)

B. Wall
1. Upper section installed first
2. Drywall installed horizontally at right angle to studs
3. Nails placed approximately 8 inches apart and dimpled
4. Use full-length sheets, if possible, to minimize seams

(Note: Do not try to fit tightly at seams--allow a small gap between each sheet --if seams are tight, buckling could result)

VI. Taping joints (TM 3)

A. Perforated joint tape is embedded in joint cement or compound at all seams and corners
1. Compound must be under and over tape after completion of operation
2. Clean off excess compound and let dry
3. Use metal edges at all outside corners and cover with compound

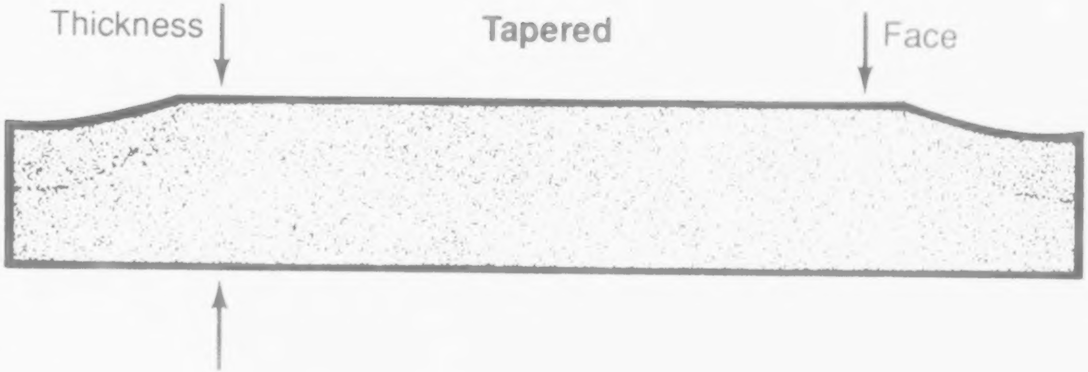
B. Second coat of seams
    1. Sand surface smooth
    2. Apply second coat of compound over seams and corners
    3. Second coat must be smooth and tapered out about 6 inches each way from seams and corners

C. Final joint finishing
    1. Sand smooth and apply topping cement to all areas to smooth any surface imperfections--seams and corners should be tapered out to a featheredge
    2. Sand smooth with sanding screen

    (Note: Special screens are available for finishing drywall)

Shapes of Gypsum Wallboard

Tapered

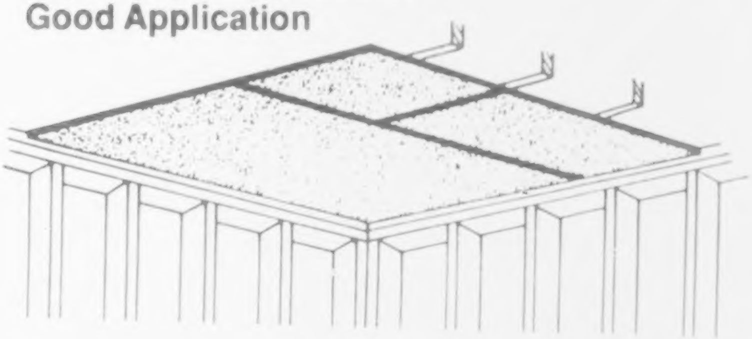

Thickness
Face

Square

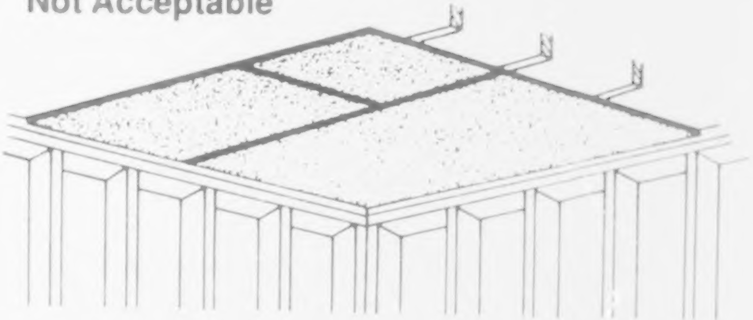
Patterns for Hanging Wallboard

Ceilings

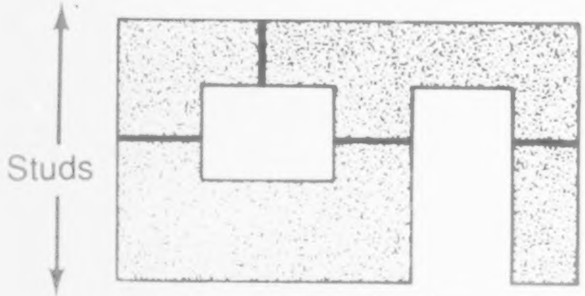
Right Angle Application
Good Application



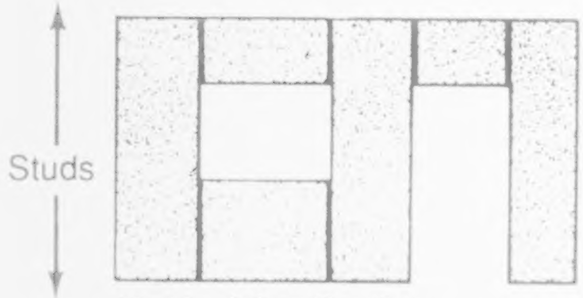
Parallel Application
Not Acceptable



Walls



Horizontal Application
Good Application

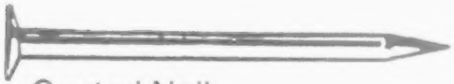


Vertical Application
Not Acceptable

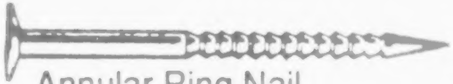
CFP 243

Fastening and Finishing Materials

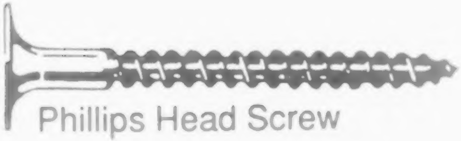
Fasteners



Coated Nail
(Galvanized or Emulsion)

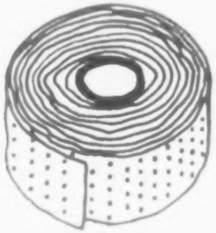


Annular Ring Nail



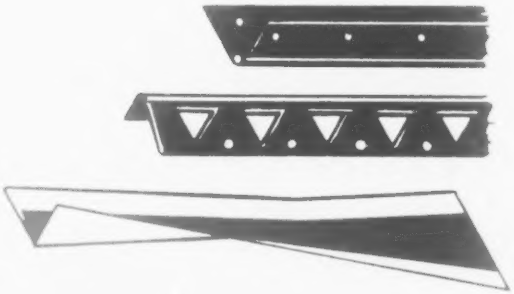
Phillips Head Screw

Finishing Materials



Perforated
Tape

Metal Corners



HANGING DRYWALL

Equipment:

Drywall hatchet
Tape measure
Utility knife
Straightedge or 4-foot T-square
Compass or keyhole saw
Ceiling support "T's"
Drywall rasp
Materials: drywall, nails, hammer, etc.

Procedure:

Evaluation
3 2 1 0

Measure and cut drywall for ceiling

1. Measure both edges of ceiling space that drywall sheet will cover to determine if walls are square.

2. Shorten above measurements by 1/4 inch to allow for proper placement of drywall to frame and mark on sheet of drywall.

3. Line up the straightedge and use the utility knife to score the finished size of the sheet deeply enough to cut through the paper.

4. Flex the sheet at the cut mark and break the gypsum material. Fold the break 90 degrees.

5. Cut the back paper to separate the two pieces.

(Note: If the initial cut is not deep enough, the break may be ragged and will need to be rasped smooth.)

6. Cut out openings for all electrical outlets with a compass saw.

Place and support wallboard while nailing

7. Place the sheet of precut wallboard on the ceiling joists, located so the edges and ends will press up loosely against joists.

(Note: Do not force in place.)

8. Place two ceiling support "T's" under the sheet and prop the sheet into its proper place.

(Note: Locate supports in such a manner that they will be directly under a joist about one-third the distance from each end of the sheet.)

9. Examine all the ends and sides to make certain the sheet will press up easily against the joists.

Nail drywall in place

10. Start nailing in the center of the sheet, placing nails approximately 6 inches apart. Finish the row of nails in each joist to about 2 inches from the edge of the sheet.

11. Hold the sheet up firmly against the joist when nailing.

(Note: Do not try to pull sheet up with the nails. The nails will break through the sheet.)

12. Dimple the nails into the surface paper so that the heads are just below the surface of the paper. Do not drive the nails deeply enough to break the surface of the paper.

13. Remove the supports and nail the sheet to the joists that were covered by the supports.

14. Nail the sheet to the end joists last. If the nails at the end joists are driven first, the weight of the sheet could pull the nails through the edge of the sheet.

Install sheets on walls

15. Cut and fit in the same manner used on the ceiling. Make certain holes for the electrical outlets are cut out.

(Note: Install the sheets horizontally on the wall whenever possible. Install the top sheets first and place them snugly against the abutting ceiling sheets.)

16. Nail from the center of the sheets out. Place the nails approximately 8 inches apart. ____

17. Dimple the nails using the same procedure used in the ceiling sheets. ____

18. Have instructor check your work. ____

19. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials. ____

Average of above evaluations* ____

*This average is the student's partial evaluation for competency E-2 of Building Maintenance.

FINISHING DRYWALL

Equipment:

Broad knives (3- and 6-inch)
12-inch plaster trowel
Materials (tape, joint cement, etc)

Procedure:

Evaluation
3 2 1 N

Finish the joints between the sheets

1. Start with the flat joints.

2. Mix the joint cement into a creamy paste and let stand for at least 1/2 hour.

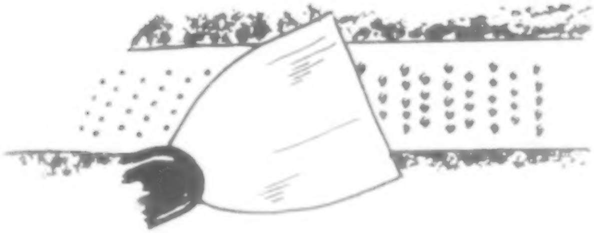
   (Note: Use a 1/2-inch drill motor with a mixer attachment to mix the joint cement if pre-mixed is not available.)

3. Use the 3-inch broad knife to spread joint cement into the depression formed by the tapered edges and over all butt joints.

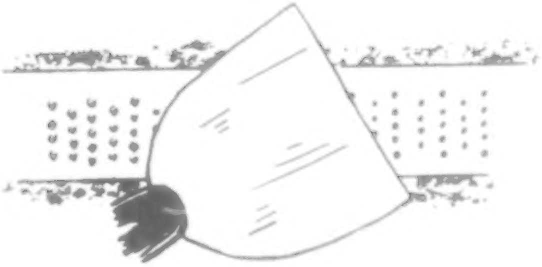
   (Note: Do not spread more than 15 or 20 feet at a time because the cement will dry out and the tape will not stick.)

4. Center the perforated tape over the joint and smooth out with the 3-inch broad knife to remove wrinkles or buckles.)

   (Note: Press firmly enough so the cement oozes through the holes in the tape.)

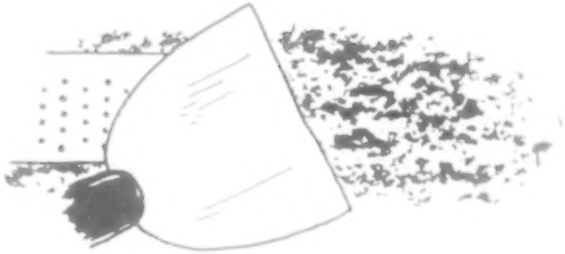


5. Go back over the joint with the 6-inch broad knife to smooth out the cement that oozed through the holes and to feather the outer edges.



6. Allow sufficient time for the cement to get completely dry.

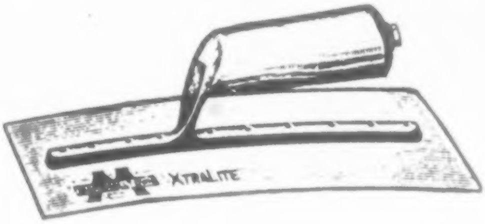
7. Apply a skim coat of joint cement over the taped joints using the 6-inch broad knife as shown.



(Note: Be sure to feather the outer edges)

8. Let cement dry completely.

9. Apply the finish coat of joint cement topping using the 12-inch trowel to obtain an even application and provide a wide feathered edge.



10. Let the cement dry completely.

11. Sand all joints.

Finish the inside corners

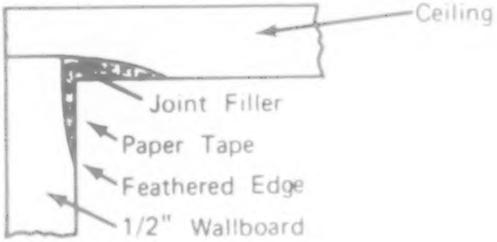
12. Cut the perforated tape into the lengths needed.

13. Fold the perforated tape in the middle.

(Note: The tape is marked in the middle to facilitate folding.)

14. Spread joint cement on both sides of the corner

(Note: Be sure to get the cement in the corner.)


Ceiling
Joint Filler
Paper Tape
Feathered Edge
1/2" Wallboard

15. Fit the folded tape into the corner and smooth out with the 3-inch knife applying enough pressure to force the cement to ooze through the holes.

    (Note: Be careful to keep the folded tape in the corner to form a straight line.)

16. Go back over both sides of the joint with the 3-inch knife to smooth out the cement that oozed through the holes and to feather out the outer edges.

17. Let the cement dry.

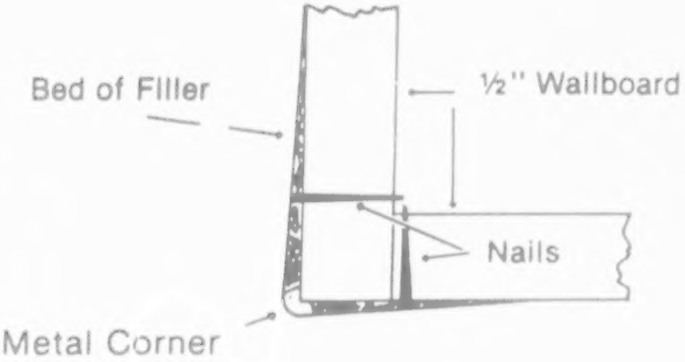
18. Apply a skim coat of joint cement with a 3-inch knife feathering out the edges.

19. Let dry.

20. Apply the finish coat with the 6-inch knife feathering out the edges.

21. Sand all joints and outside corners.

    (Note: Metal corner already installed as illustrated below.)



22. Apply a skim coat of joint cement at each side of the corner with the 3-inch knife and feather the inside edge. ____ ____ ____ ____

23. Let dry. ____ ____ ____ ____

24. Apply another coat of cement with the 6-inch knife and feather the inside edge. ____ ____ ____ ____

25. Let dry. ____ ____ ____ ____

26. Apply the final coat of cement with the 12-inch trowel and feather the inside edges. ____ ____ ____ ____

27. Let dry. ____ ____ ____ ____

28. Sand all outside corners. ____ ____ ____ ____

29. Have instructor check your work. ____ ____ ____ ____

30. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials. ____ ____ ____ ____

Average of above evaluations* ____ ____ ____ ____

*This average is the student's partial evaluation for competency E-2 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 1: INTERIOR FINISHING

LESSON TEST

______ 1. Drywall comes in what thicknesses? (More than one correct answer.)

A. 1/4-inch
B. 3/16-inch
C. 3/4-inch
D. 1/2-inch
E. 5/8-inch

______ 2. Drywall edges come in what shapes? (More than one correct answer.)

A. Square
B. Oval
C. Round
D. Tapered

MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT II, LESSON 1 TEST

1. A, C, D, E
2. A, D

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 2: REPAIR/REPLACE INTERIOR WALL PANELING

LESSON OBJECTIVE

After completion of this lesson, the student will be able to REPAIR/REPLACE INTERIOR WALL PANELING. Mastery will be evidenced by satisfactory completion of job sheet and by scoring ________ percent on the lesson test.

SPECIFIC OBJECTIVES

1. List two methods of panel application.
2. State the standard sizes and thicknesses of paneling.
3. State the edge shapes of paneling.
4. Hang wall paneling.

Completion of the requirements of this lesson fulfills competencies E-3 and E-10 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 2: REPAIR/REPLACE INTERIOR WALL PANELING

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Transparency master
  1. Methods of installing wall paneling

D. Job sheet
  1. Installing wall paneling

E. Lesson test

F. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 2: REPAIR/REPLACE INTERIOR WALL PANELING

INFORMATION OUTLINE

I. Sizes of wall paneling

- A. Standard sheets are 4 feet by 8 feet

- B. Thickness varies from 3/16" to 3/4"

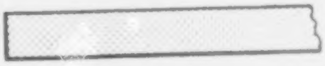
II. Styles of wall paneling

- A. Natural or unfinished
  1. Grooved
  2. Plain

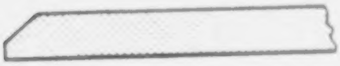
- B. Prefinished
  1. Grooved
  2. Striated
  3. Decorative design

III. Edge shapes

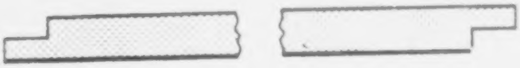
- A. Square



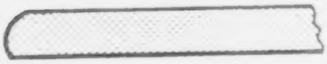
- B. V groove
  (Note: Most commonly used in interior paneling)



- C. Lap



- D. Round



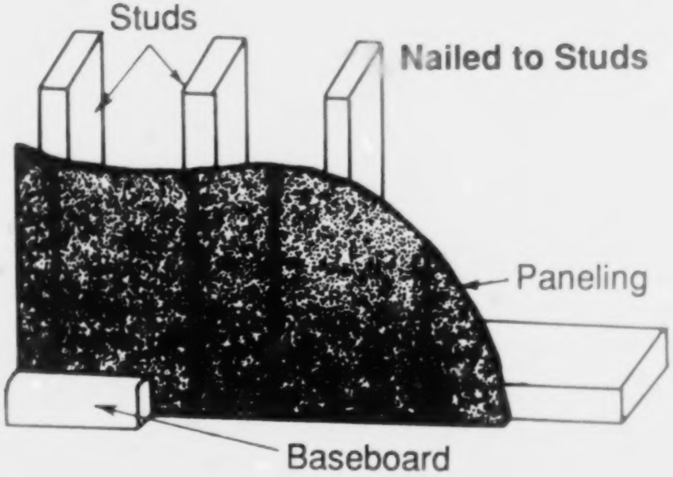
IV. Methods of application (TM 1)

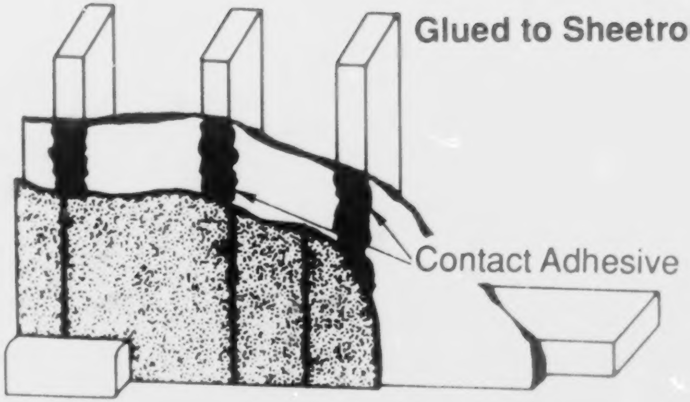
- A. Fastening
  - 1. Nails

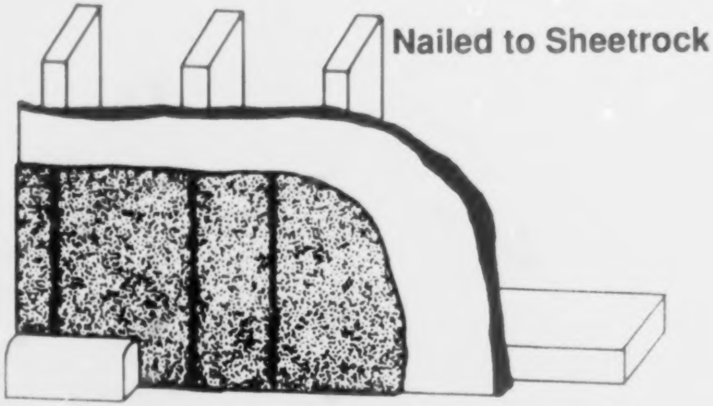
    (Note: Colored nails may be purchased to match finished paneling)
  - 2. Glue

    (CAUTION: Adhesives are toxic and should be used in well ventilated areas)
- B. Jointing
  - 1. Joint paneling uses a solid backing.
  - 2. If a wall has been paneled, do not use joint paneling on the same studs as the sheetrock joints

Methods of Installing Wall Paneling


Nailed to Studs
Studs
Paneling
Baseboard


Glued to Sheetrock
Contact Adhesive


Nailed to Sheetrock

CFP 267

TM 1

INSTALLING WALL PANELING

Equipment:

- Tape measure
- Framing square
- Pencil
- Paneling adhesive
- Hammer
- Paneling
- Paneling nails
- Saber saw
- Table saw
- Molding
- Eye protection

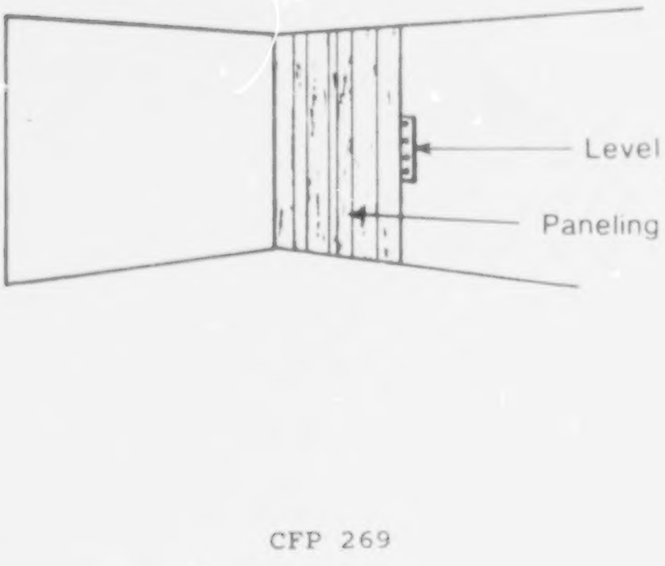
Procedure:

Evaluation
3 2 1 N

1. Stand the paneling on end around the room with the grain patterns matching on adjoining paneling the best way possible. ___ ___ ___ ___

2. Plumb the edge of paneling away from an inside corner of the room and trim the edge to fit the corner. ___ ___ ___ ___

   (Note: All paneling joints should be centered on a stud.)



3. Measure the location of wall outlet if necessary. __ __ __ __

4. Use the framing square to draw accurately the location of any wall outlet. __ __ __ __

5. Apply paneling adhesive on the wall where the edges and middle of the paneling will be located. __ __ __ __

6. Nail the paneling in place and plumb. __ __ __ __

   (Note: Nail each sheet on every stud.)

7. Align paneling with the edges of doors and windows when possible. __ __ __ __

   (Note: This will cause fewer scraps.)

8. Measure the location of any switches or wall outlets accurately. __ __ __ __

   (Note: Measure down from the ceiling and over from the paneling in place or a corner.)

9. Install the remaining paneling around the room. __ __ __ __

   (Note: Set each nail flush with the paneling surface.)

10. Panel inside the window openings. __ __ __ __

11. Install molding on corners, baseboards, and ceilings. __ __ __ __

12. Have instructor check your work. __ __ __ __

13. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials. __ __ __ __

Average of above evaluations* __ __ __ __

***This average is the student's partial evaluation for competencies E-3 and E-10.**

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 2: REPAIR/REPLACE INTERIOR WALL PANELING

LESSON TEST

1. List two methods of applying wall paneling.

2. What is the normal thickness range of wall paneling?

3. What is the standard size of wall paneling?

4. List the two edge shapes of wall paneling.

MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT II, LESSON 2 TEST

1. Nails and glue
2. 3/16-inch to 3/4-inch
3. Four feet by 8 feet
4. Square, V groove, lap, round

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 3: FLOOR COVERING

LESSON OBJECTIVE

After completion of this lesson, the student will be able to IDENTIFY DIFFERENT TYPES OF FLOOR COVERING AND UNDERLAYMENT. Mastery will be evidenced by scoring ____________ percent on the lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Identify the types of finish flooring materials.
2. Identify three types of underlayment.

Completion of the requirements of this lesson fulfills competency E-5 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 3: FLOOR COVERING

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Lesson test

D. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 3: FLOOR COVERING

INFORMATION OUTLINE

I. Flooring as it relates to carpentry

   A. Last job a carpenter does

   B. Often laid by specialists

   C. Carpenter needs to know
      1. Different types of flooring
      2. How to install finish flooring
      3. How to make ready for flooring installation

II. Types of finish flooring materials and their installation

   A. Hardwood (most commonly oak)
      1. Tongue-and-groove
         a. Most commonly short-end matched pieces installed by blind-nailing at a 50 angle through the tongue into the subfloor
         b. Long tongue-and-groove edged pieces (installed by nailing at a 50 angle through the tongue into the subfloor
      2. Strip flooring (installed by blind-nailing)
      3. Prefabricated blocks (installed with nails or by gluing to the subfloor)
      4. Prefabricated blocks (installed with nails or by gluing to the subfloor)
      5. After installation, hardwood floors must be finished by sanding, filling, and varnishing

   B. Resilient coverings
      1. Made of asphalt, rubber, vinyl asbestos, or cork
      2. Block
         a. Comes in 9- by 9-inch and 12- by 12-inch squares and requires an underlayment over wood subfloor
         b. Applied with mastic cement
         c. Can be laid over concrete

3. Linoleum
    a. Manufactured in rolls of different widths and requires an underlayment
    b. If patterned, matching is necessary
    c. Applied with mastic

C. Clay tile
  1. Comes in different colors and designs
  2. Applied with a grouting cement
  3. Usually installed over concrete
     (Note: Other than in small areas, tile is not usually installed over wooden floors because shifting of the wood base usually occurs)

D. Carpeting
  1. Rubber-backed
    a. Needs an underlayment
    b. Usually installed with mastic
    c. Does not require stretching
    d. Patterns must be matched so splices do not show
  2. Jute-backed
    a. Applied with tack strips
    b. Must be stretched
    c. Patterns must be matched so splices do not show
    d. More expensive than rubber-backed

III. Types of underlayment

A. Particle board
  1. Used where it cannot be affected by water
  2. Installed by splicing over floor joists and nailing with ring-shank nails or cement-coated nails

B. Plywood
  1. Has same application as particle board: both are available in different thicknesses

C. Hardboard
  1. Manufactured in 1/8- to 1/4-inch sheets
  2. Resistant to moisture
  3. Provides smooth surface for linoleum
  4. Installed by splicing over floor joists and nailing with ring-shank or cement-coated nails

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 3: FLOOR COVERING

LESSON TEST

_______1. Which of the following are types of finished floor coverings? (More than one answer.)

A. Clay tile
B. Plywood
C. Hardwood
D. Particle board
E. Carpet

_______2. Which of the following are types of underlayment?

A. Hardboard
B. Carpet
C. Plywood
D. Particle board
E. Linoleum

_______3. Which underlayment is used when moisture might be present?

A. Particle board
B. Hardboard
C. Plywood

_______4. Over what kind of surface does one usually install clay tile?

A. Wood
B. Concrete
C. Tile
D. Carpet

_______5. Which of the following are resilient coverings?

A. Linoleum
B. Carpet
C. Hardwood
D. Clay tile

ANSWERS TO UNIT II, LESSON 3 TEST

1. A, C, E
2. A, C, D
3. B
4. B
5. A

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 4: CEILING SYSTEMS

LESSON OBJECTIVE

After completion of this lesson, the student will be able to INSTALL A CEILING SYSTEM. Mastery will be evidenced by completion of job sheet and by scoring __________ percent on the lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Identify different styles of ceiling systems.
2. Know the tools needed to install a ceiling system.
3. Install ceiling tile.

Completion of the requirements of this lesson fulfills competency E-6 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 4: CEILING SYSTEMS

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Transparency master
   1. Patterns of ceiling tile
   2. Methods of installing ceiling tile

D. Job sheet
   1. Installing ceiling tile

E. Lesson test

F. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 4: CEILING SYSTEMS

INFORMATION OUTLINE

I. Terms and definitions

  A. Acoustical--a rough surface on ceiling tile or other materials that absorbs noise

  B. Striated--a lined pattern marked on or cut into material

  C. Toxic--a poisonous substance

  D. Lath--thin strips of wood nailed to the ceiling joists to provide a nailing surface for ceiling tile

  E. Adhesive--a type of glue used for hanging tile or paneling

  F. Prefinished--a lacquer or varnish coating applied at the factory

  G. Furring--strips of wood nailed on a surface to provide a nailing surface for another material or covering

II. Common patterns of tile used on ceilings (TM 1)

  A. Plain

  B. Hole punched

  C. Decorative

III. Methods of installing ceiling tile (TM 2)

  A. Glued or nailed to solid surface

  B. Suspended by metal framework

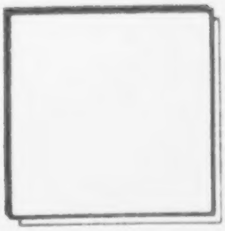
  C. Nailed or stapled to lathe

IV. Common ceiling sizes

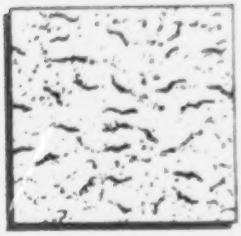
  A. 12-inch by 12-inch

  B. 24-inch by 48-inch

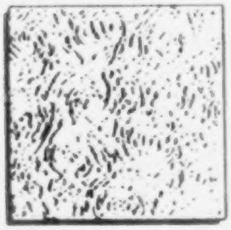
Patterns of Ceiling Tile



1. Plain



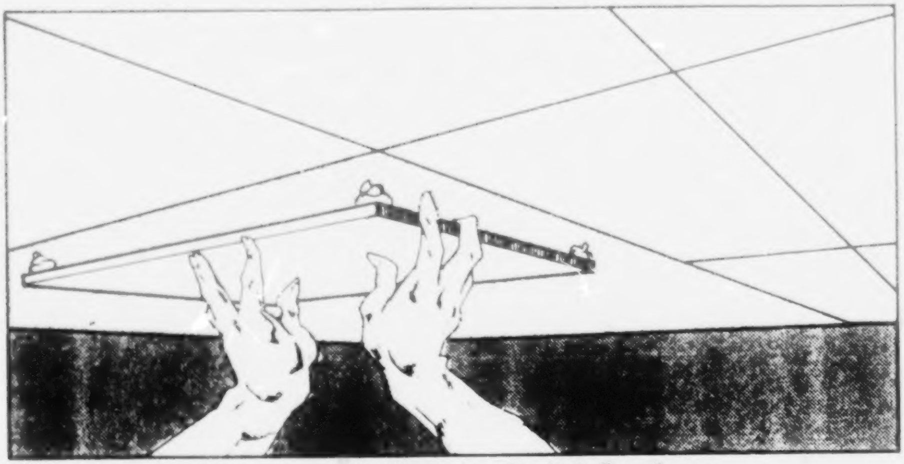
2. Hole Punched



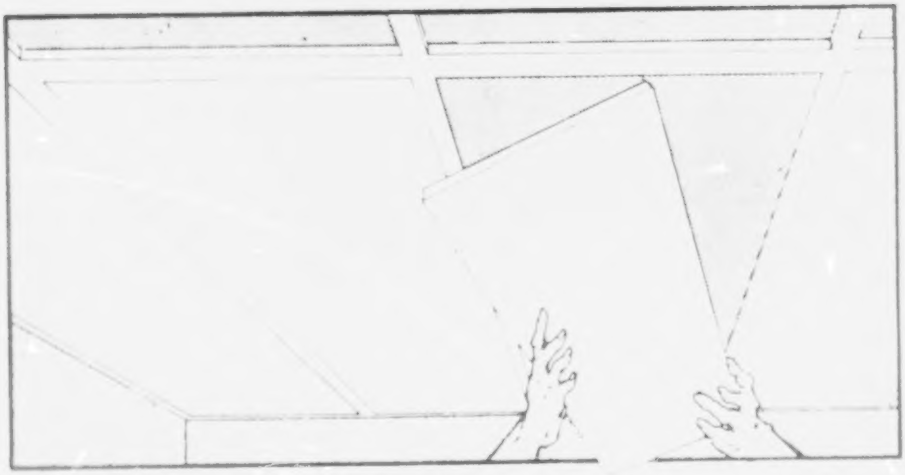
3.Decorative

TM 2

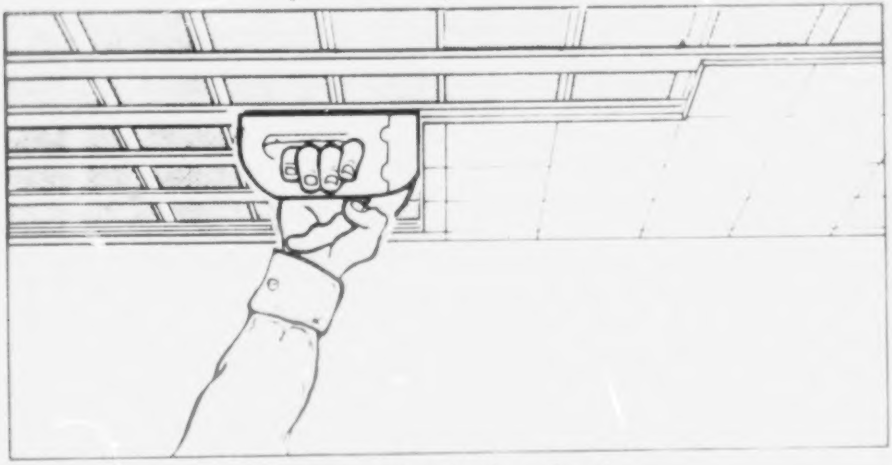
Methods of Installing Ceiling Tile



Glued or Nailed to Solid Surface



Suspended by Metalwork



Nailed or Stapled to Lathe

CFP 293

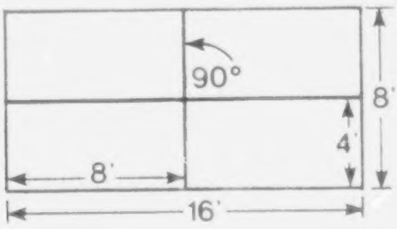
JS 1

INSTALLING CEILING TILE

Equipment:

Tape measure
Framing square
Chalk line
Pencil
Knife
Furring strips if required
Stapler or adhesive or suspended
Hammer
12-inch by 12-inch (or 24-inch by 48-inch) ceiling tile
1-inch by 3-inch furring strips if required
Eye protection

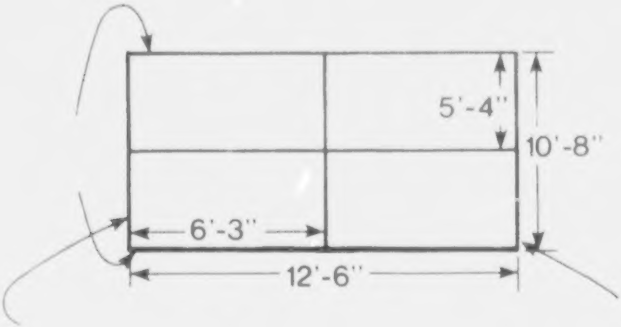
Procedure:	Evaluation			
	3	2	1	N
1. Measure the two short walls of the room.	___	___	___	___
2. Mark the midpoint of each wall.	___	___	___	___
3. Chalk a line between the two marks.	___	___	___	___
4. Locate the center of the chalk line.	___	___	___	___
5. Chalk a line across the ceiling at a right angle and on center to the first line.	___	___	___	___



6. Count the number of tiles required from the center line to the wall.	___	___	___	___

7. Trim tile for a border row if the distance from the center of room to wall is not an exact number of feet. — — — —

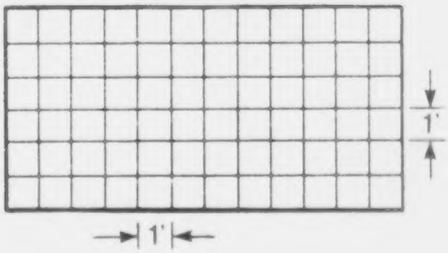
(Note: This will produce an even appearance of the room with all border tiles being the same size for opposite sides of the room.)



Trim a border row 4" wide for these walls

Trim a border row 3" wide for these walls

8. Chalk lines 1-foot apart and parallel to the center lines across the ceiling. — — — —



9. Nail 1-foot by 3-foot furring strips across the room in one direction and on center of the chalk lines. — — — —

(Note: The furring strips should be at right angles to the ceiling joists.)

10. Check furring strips for levelness with a string or straightedge. — — — —

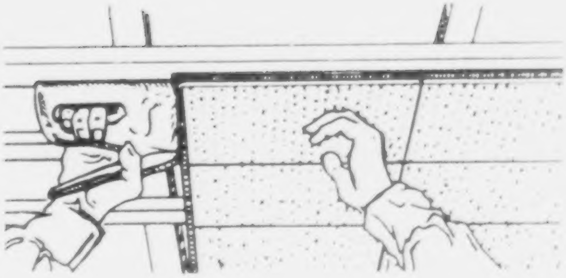
11. Chalk a line on the end of furring strips to line up the border tile. — — — —

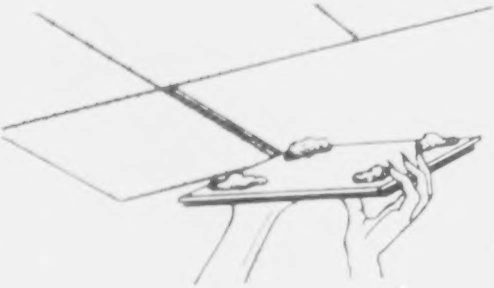
12. Start installing tile in a corner. — — — —

(Note: Remember to use the border tile and align them with the chalk line and center of furring strips if used.)

13. Staple the tile to the furring strips or glue the tile to the ceiling depending on method of installation used. — — — —

(Note: Use three staples along each flange of the tile.) — — — —





14. Staple or glue the rest of the full-size tile. ___ ___ ___ ___

15. Staple or glue the border tile along the remaining wall. ___ ___ ___ ___

    (Note: Nails should be close to the wall.)

16. Have instructor check your work. ___ ___ ___ ___

17. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials. ___ ___ ___ ___

Average of above evaluations* ___ ___ ___ ___

***This average is the student's partial evaluation for competency E-6 of Building Maintenance.**

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

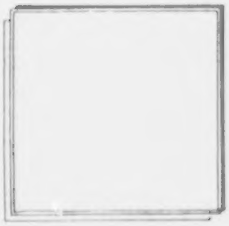
LESSON 4: CEILING SYSTEMS

LESSON TEST

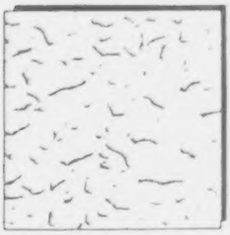
Part I. From the list below, correctly label each type of ceiling tile.

A. Decorative B. Plain C. Hole-punched

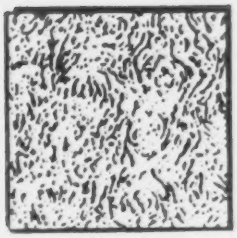
_____1.



_____2.



_____3.



Part 2. List three different methods of installing ceiling tile.

4.

5.

6.

Part 3. What are the two standard tile sizes?

7.

8.

MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT II, LESSON 4 TEST

Part 1.

1. B
2. C
3. A

Part 2.

(Can be in any order)

4. Glued or nailed to solid surface
5. Suspended by metal framework
6. Nailed or stapled to lathe

Part 3.

(Can be in any order)

7. 12-inch by 12-inch
8. 24-inch by 48-inch

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 5: INSULATION

LESSON OBJECTIVE

After completion of this lesson, the student will be able to INSTALL INSULATION IN WALLS AND CEILING. Mastery will be evidenced by completion of job sheet and by scoring _________ percent on the lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Match insulation terms with their definitions.
2. Recognize the forms of thermal insulation.
3. Choose from a list of materials the correct ones for installing insulation.
4. Install insulation in walls and ceiling.

Completion of the requirements of this lesson fulfills competency E-7 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 5: INSULATION

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Transparency masters
   1. Forms of thermal insulation
   2. Ceiling insulation--batt
   3. Ceiling insulation--loose fill
   4. Exterior wall insulation
   5. Floor insulation--wood floor over unheated crawl space
   6. Floor insulation--slab

D. Job sheet
   1. Install insulation

E. Lesson test

F. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 5: INSULATION

INFORMATION OUTLINE

I. Terms and definitions

   A. Insulation--any material that prevents the transmission of heat energy through space

   B. Vapor barrier--a material that has a high resistance to the passage of vapors or moisture

   C. Batt insulation--matted fibers of organic or inorganic material made into small, easy-to-handle units

   D. Blanket insulation--a flexible type of lightweight material made of fibers of loosely compacted material formed into rolls or strips that are usually attached to a paper-backed vapor barrier

   E. Conduction--the process of transmitting heat from particle to particle within a material

   F. Convection--the process of transmitting heat through a space by air or liquid currents

   G. Radiation--a material transmission of heat energy through space

II. Purposes of thermal insulation

   A. To intercept or resist the passage of heat or cold into or out of a building

   B. To reduce the cost of heating or cooling a building

III. Transmission of heat

   A. Conduction

   B. Convection

   C. Radiation

IV. Insulation materials

- A. Fiberglass
- B. Rockwool
- C. Polystyrene foams

V. Forms of insulation (TM 1)

- A. Batt
  1. Usually made of fiberglass or rockwool
  2. Available in different thicknesses and widths
- B. Blanket
  1. Usually made of fiberglass or rockwool
  2. Available in 16- and 24-inch widths and 8-foot lengths or rolls of variable thickness
- C. Rigid
  1. Made of loosely compressed wood fiber or foam
  2. Variable sizes in different combinations of thickness, width, and length
- D. Loose fill
  1. Made from a variety of materials that are heat-resistant, fire-resistant, light in weight, cost-efficient, and compact
  2. Available in bundles, bags or bales
  3. May be poured, blown, or placed by hand

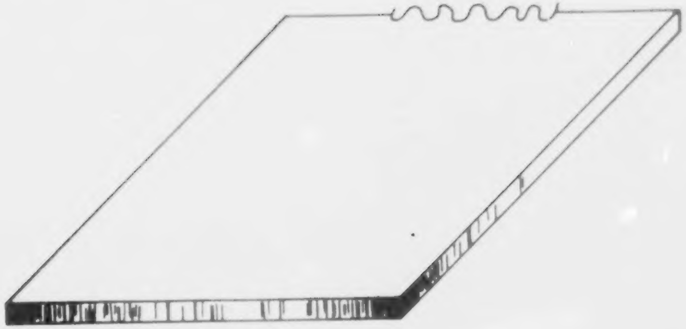
VI. Places where thermal insulation is used in buildings (TM 1, TM 2, TM 3, TM 4, TM 5, TM 6)

- A. Ceilings--batts, blankets or loose fill
- B. Exterior walls--batts, blankets, or loose fill

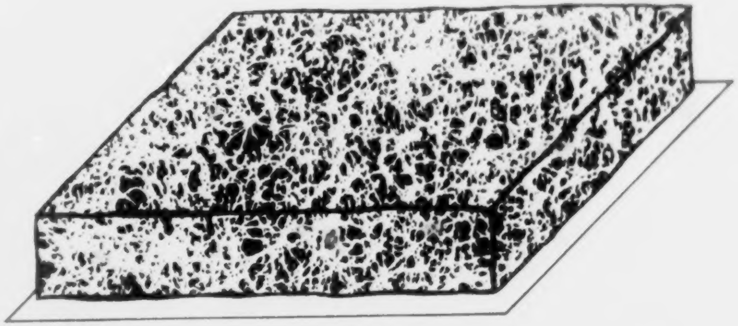
  (Note: Batts and blankets are most common for new construction)
- C. Floors
  1. Usually not insulated
  2. Batts or blankets may be used if desired

Forms of Thermal Insulation

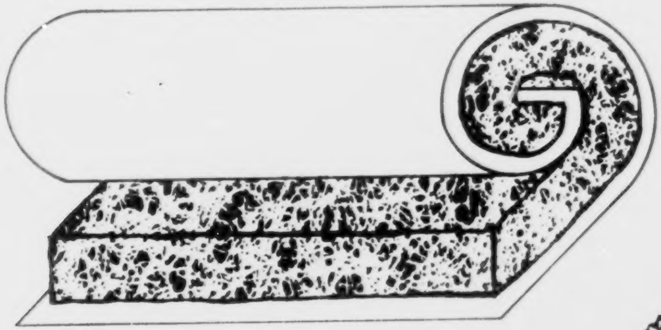
CFP 309



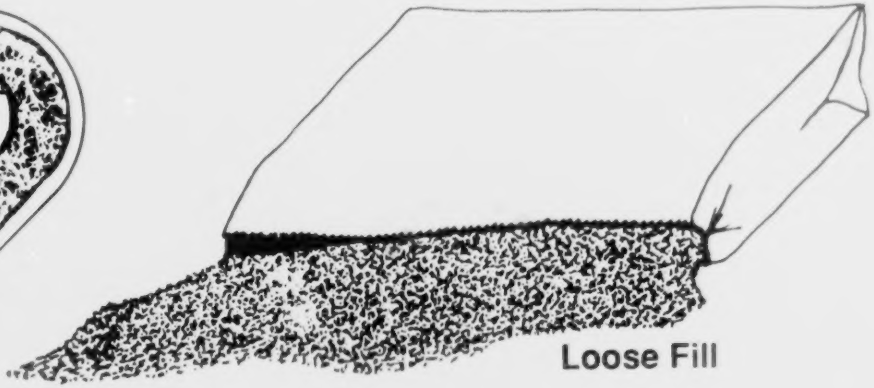
Rigid



Batt



Blanket



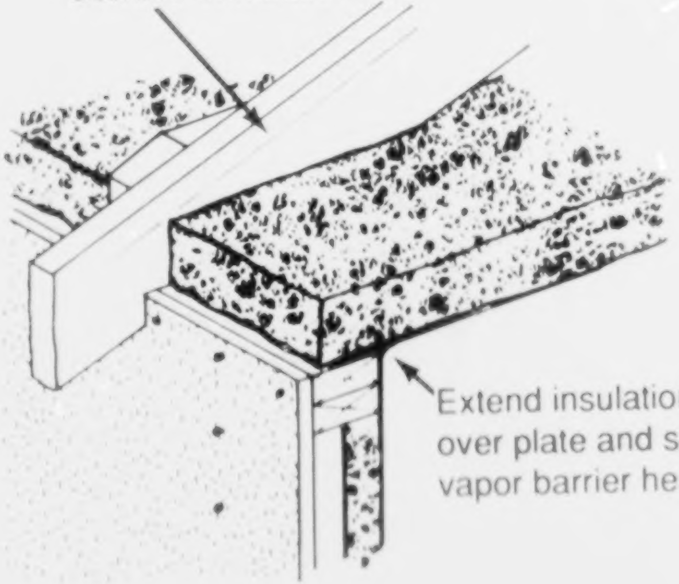
Loose Fill

TM 1

Ceiling Insulation

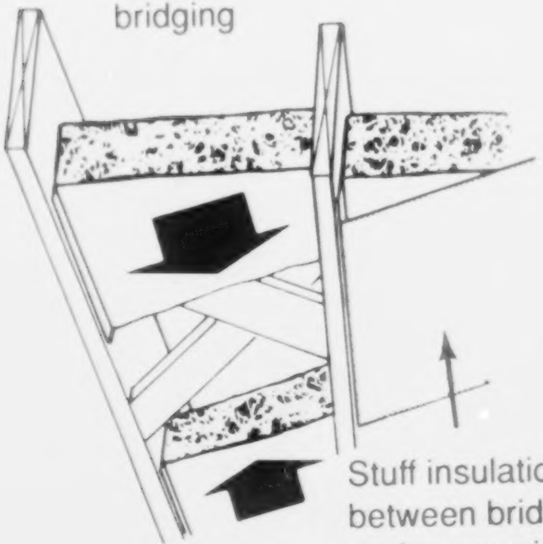
Batt

CFP 311



Clearance for Cornice Ventilation

Extend insulation over plate and staple vapor barrier here



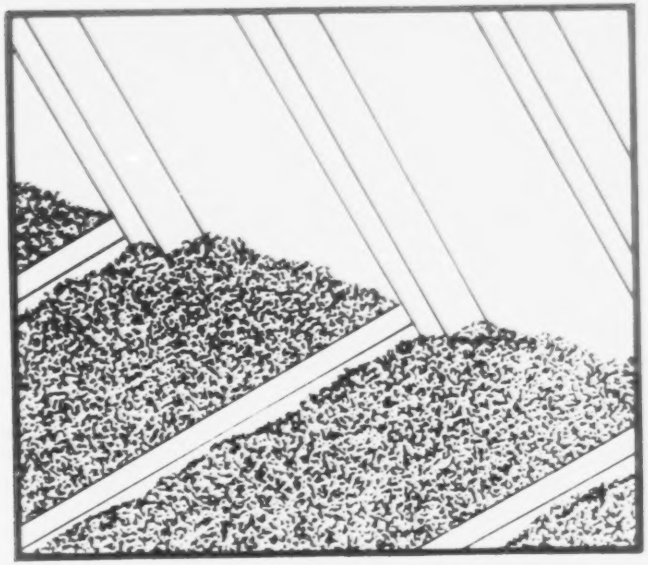
Butt batts snugly to bridging

Stuff insulation between bridging and cover with vapor barrier to overlap both batts

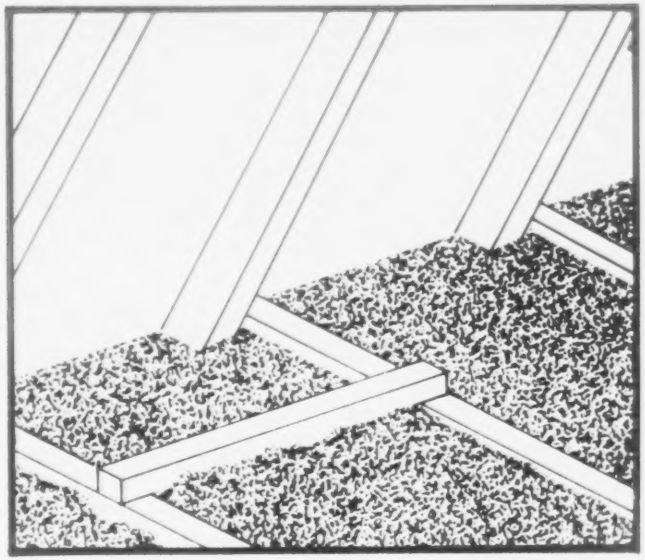
TM 2

Ceiling Insulation

Loose Fill



Loose Fill is Poured Between Ceiling Joists

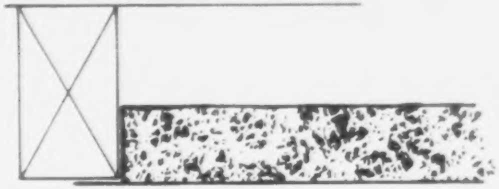


Template is Used to Gauge the Depth of the Insulation

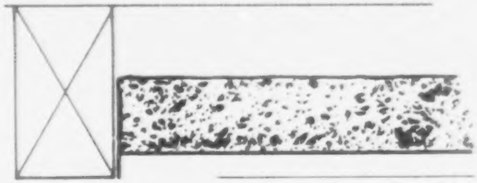
Exterior Wall Insulation
Ceiling Insulation

CFP 315

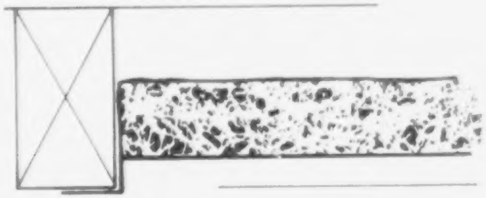
Methods of installing Blankets and Batts



Flush with Inside Surface of Stud

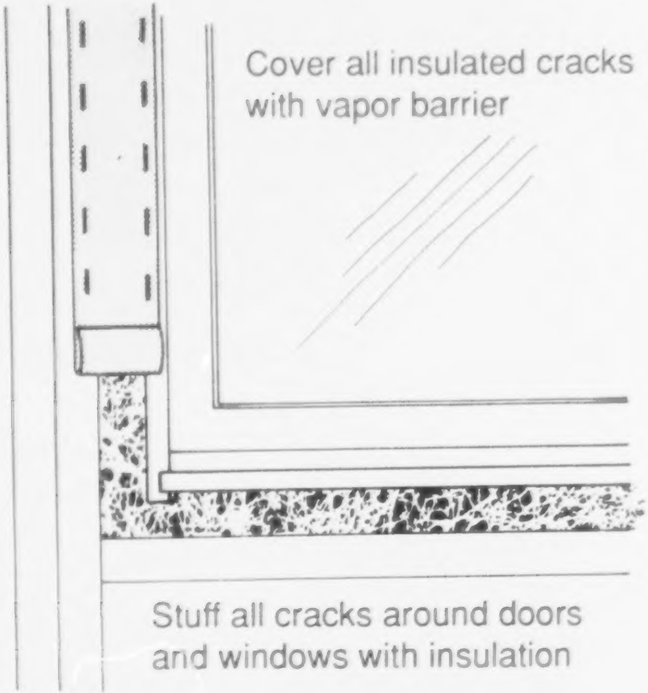


Flange Stapled along Side of Stud to Form Air Space



Special Flange

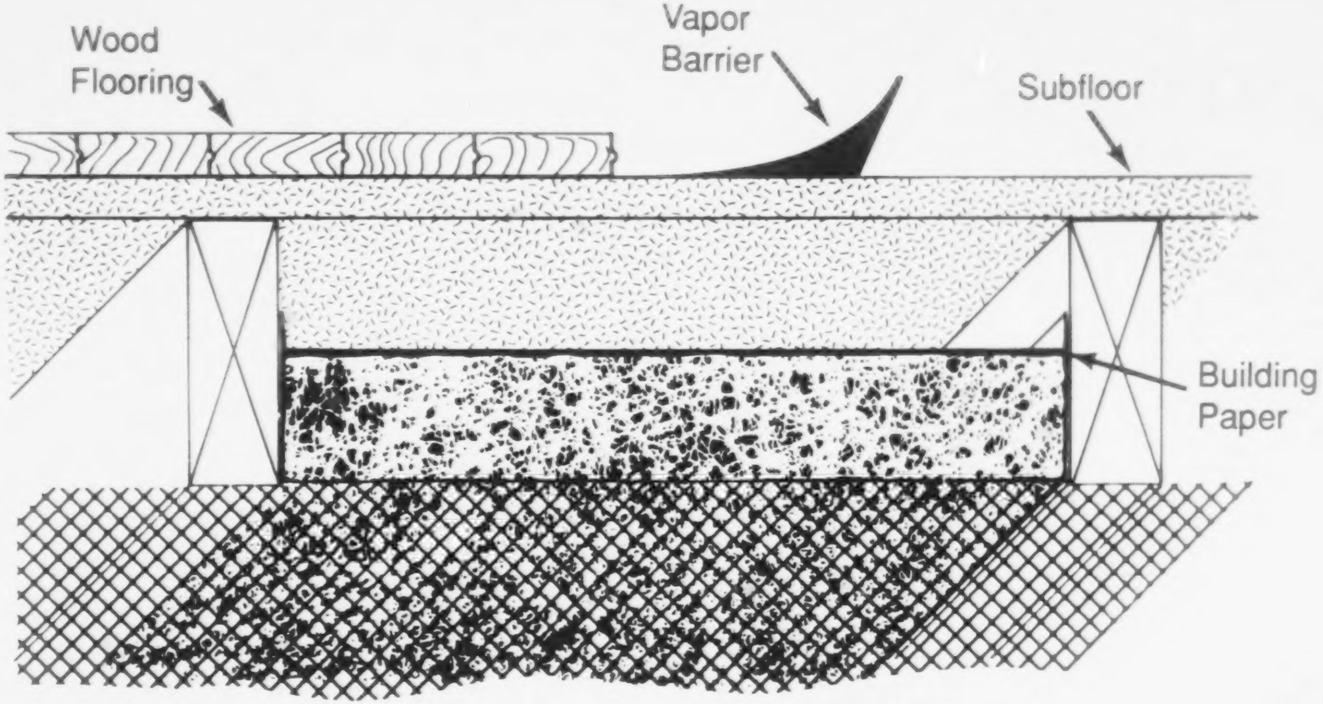
Insulating around Windows and Door Frames


Cover all insulated cracks with vapor barrier
Stuff all cracks around doors and windows with insulation

TM 4

Floor Insulation

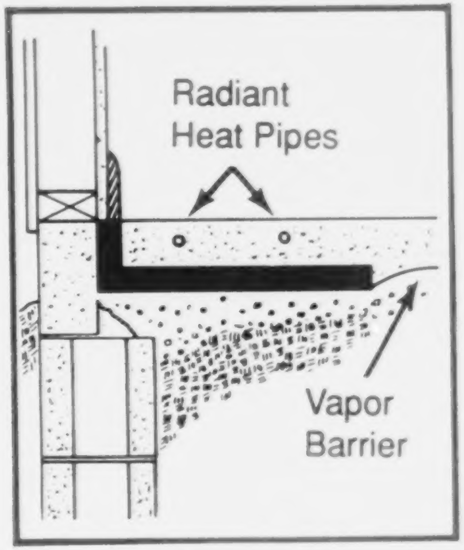
Wood Floor Over Unheated Crawl Space

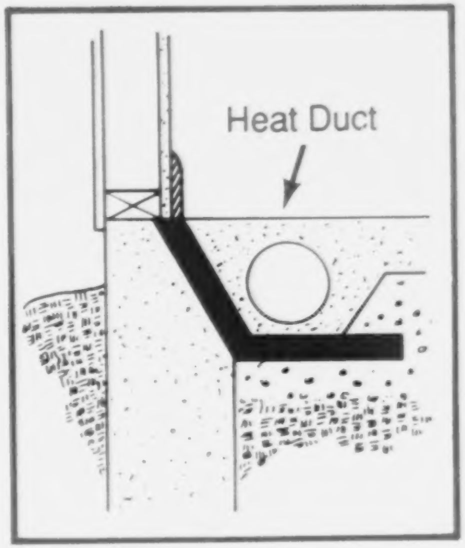

Wood Flooring
Vapor Barrier
Subfloor
Building Paper

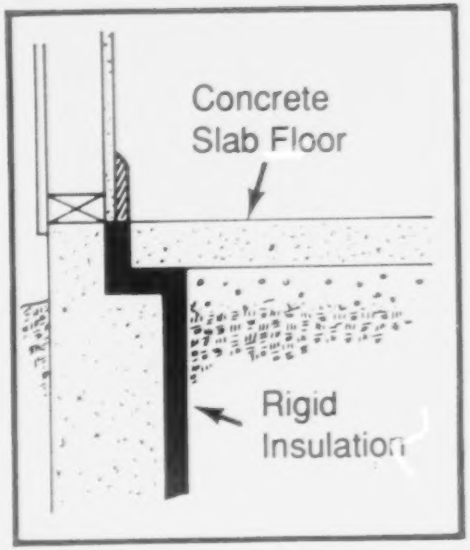
Staple wire mesh to support insulation

Floor Insulation

Slab Floor


Radiant
Heat Pipes
Vapor
Barrier




Concrete
Slab Floor
Rigid
Insulation

INSTALL INSULATION

Equipment:

Knife
13-ounce hammer
Stapler and staples
Tape measure
Straight edge
Insulation (batt and blanket type)
Duct tape
Eye protection

Procedure:

Evaluation
3 2 1 N

(Note: All plumbing, electrical, and heating and cooling duct work must be roughed in before insulating.)

1. Cut insulation rolls into 8-foot lengths. ___ ___ ___ ___

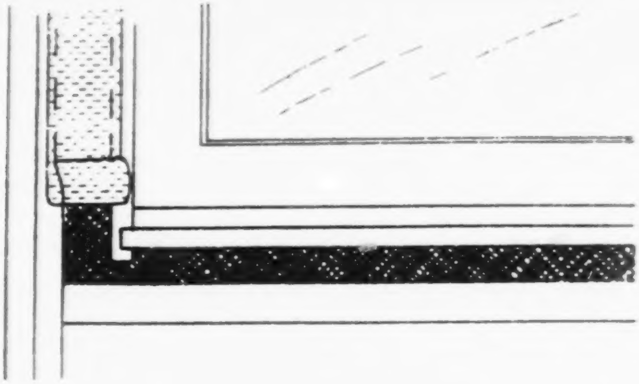
   (Note: Use the straight edge and knife for cutting.)

2. Place the 8-foot lengths between the studs and staple in place. ___ ___ ___ ___

Flange Stapled along Side of Stud to Form Air Space

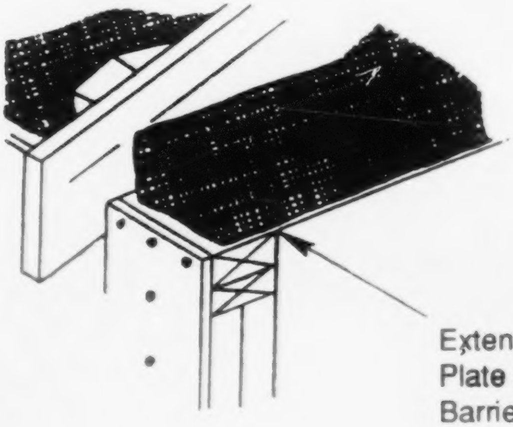
3. Stuff insulation into cracks around doors and windows. ___ ___ ___ ___

4. Apply tape for a vapor barrier over the cracks. ____



5. Starting at the wall, staple batts of insulation between the ceiling joists. ____

(Note: Make sure batts are close together so there are no air spaces.)



Extend Insulation over Plate and Staple Vapor Barrier here

6. Place insulation around any bracing so that the ceiling is solidly covered. — — — —

(Note: Vapor barriers should be placed on the room side of the insulation.)

7. Have instructor check your work. — — — —

8. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials. — — — —

Average of above evaluations* — — — —

*This average is the student's partial evaluation for competency E-7 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 5: INSULATION

LESSON TEST

Part 1. Match the terms below with their correct definitions.

A. Blanket insulation
B. Convection
C. Batt insulation
D. Vapor barrier
E. Radiation
AB. Insulation
AC. Conduction

_________ 1. Any material that prevents the transmission of heat energy through space

_________ 2. A material that has a high resistance to the passage of vapors or moisture

_________ 3. Matted fibers of organic or inorganic material made into small, easy-to-handle units

_________ 4. A flexible type of lightweight material made of fibers of loosely compacted material formed into rolls or strips that are usually attached to a paper-backed vapor barrier

_________ 5. The process of transmitting heat from particle to particle within a material

_________ 6. The process of transmitting heat through a space by air or liquid currents

_________ 7. A material transmission of heat energy through space

Part 2. Place a "T" on the blank before each piece of equipment used to install insulation. Place an "F" on the blank before each piece of equipment that is not used in installing insulation.

_________ 8. Saw

_________ 9. Knife

_________ 10. Hammer

_________ 11. Square

_________ 12. Stapler and staples

_________ 13. Duct tape

_________ 14. Miter box

_________ 15. Eye protection

_________ 16. Insulation

_________ 17. Screw driver

_________ 18. Straightedge

_________ 19. Drill

_________ 20. Tape measure

MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT II, LESSON 5 TEST

Part 1.

1. AB

2. D

3. C

4. A

5. AC

6. B

7. E

Part 2.

8. F

9. T

10. T

11. F

12. T

13. T

14. F

15. T

16. T

17. F

18. T

19. F

20. T

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 6: INTERIOR FINISHING

LESSON OBJECTIVE

After completion of this lesson, the student will be able to INSTALL OR REPLACE INTERIOR TRIM AND MILLWORK. Mastery will be evidenced by completion of job sheets and by scoring __________ percent on the lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Identify the types of molding and where they are used.
2. Name the techniques used to joint pieces of molding and trim.
3. Trim a door.
4. Trim a window.
5. Install a baseboard.
6. Install moldings.

Completion of the requirements of this lesson fulfills competency E-8 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 6: INTERIOR FINISHING

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Transparency masters
  1. Molding
  2. Common trim and molding joints

D. Job sheets
  1. Install door trim
  2. Install window trim
  3. Install final trim to windows and doors
  4. Cut and install baseboard and trim

E. Lesson test

F. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 6: INTERIOR FINISHING

INFORMATION OUTLINE

I. Types of molding and trim (TM 1, TM 2)

  A. Baseboard
    1. Trim installed along the base of the wall to cover corners and serve as lower wall trim
    2. Available in different surface designs

  B. Base shoe--small, narrow molding used around a room at the base of the baseboard

  C. Cove molding and bed molding--trim used primarily where the wall meets the ceiling or to join other 90-degree outside corners

  D. Corner molding--trim used to cover 90-degree outside corners

  E. Quarter round--a type of molding that presents a profile of a quarter of a circle--it is installed over cracks or voids where two surfaces intersect at 90 degrees

  F. Casing
    1. Trim--installed around doors or windows to cover openings between the jamb and wall (it also helps anchor window units in place)
    2. Different surface designs are available

  G. Stool--the base or support at the bottom of a window that extends into the room

  H. Apron--a piece of trim placed horizontally under the stool

  I. Door and window stops--trim installed to fit against doors and windows when closed to insure proper closure and help eliminate passage of air

II. Door and window parts associated with installation of trim

  A. Frame--an assembly of wood parts that forms an enclosure and support for a door or window

  B. Head jamb--the top member of a door or window frame

C. Side jamb--the vertical side posts of a door or window frame

D. Threshold--a wood or metal member used to close the space at the bottom of a door at the sill

III. Procedures and tools used in trim installation

A. Cope--to cut or shape the end of a piece of molding so it will cover and fit the contour of an adjoining piece of molding at a joint

B. Miter joint--the joining of two pieces by making a cut in each piece which bisects the joining angle (for example, the miter joint at the side and head casing of a door frame is made at 45-degrees to form a finished joint of 90-degrees)

C. Jig--a device used for guiding tools while work is being done

IV. Hand of a door

A. Procedures to determine the hand of a door
   1. If the door swings into the room from outside--face the door from the outside (the direction the door swings indicates right- or left-hand door)
   2. If the door swings out of the room, face the door from the outside (the direction the door swings is right-hand reverse or left-hand reverse)

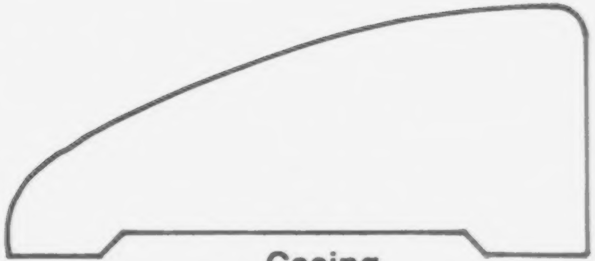
B. These labels apply to all doors

C. If two doors are installed in the same opening, such as entrance and storm doors, then one has to swing in and the other swing out

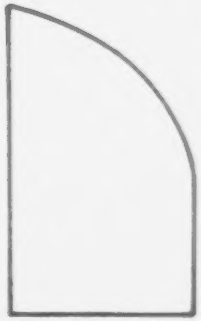
D. An easy method to determine the hand of a door is to stand in the open door with your back to the hinge joint--then open the door--(if it opens to your left, it is a left-hand door--if it opens to your right, it is a right-hand door)

(Note: This does not apply to a storm door--it becomes either a right- or left-hand reverse depending on how it swings)

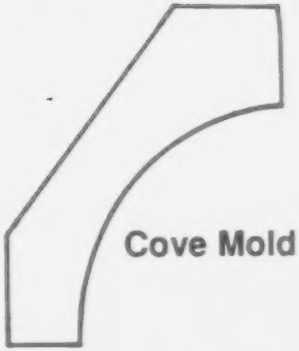
Molding



Casing

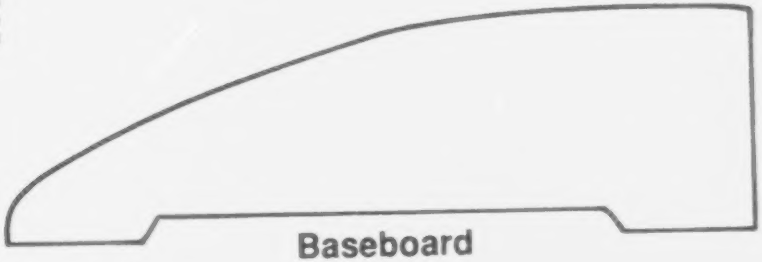


Base Shoe

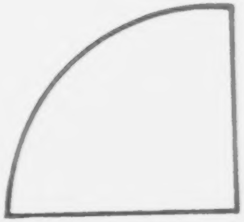


Cove Mold

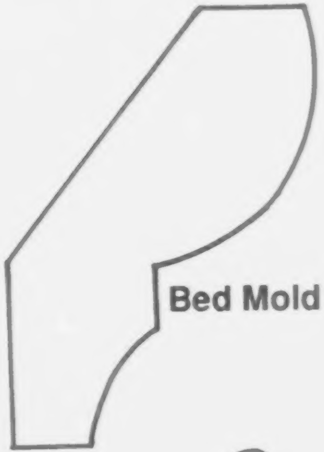
CFP 335



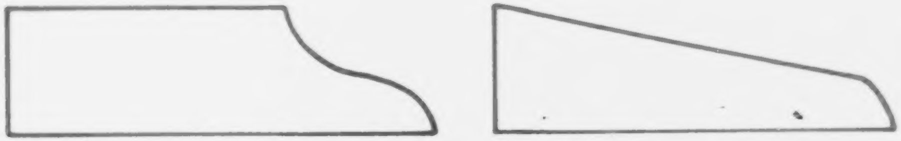
Baseboard



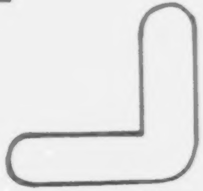
Quarter Round



Bed Mold



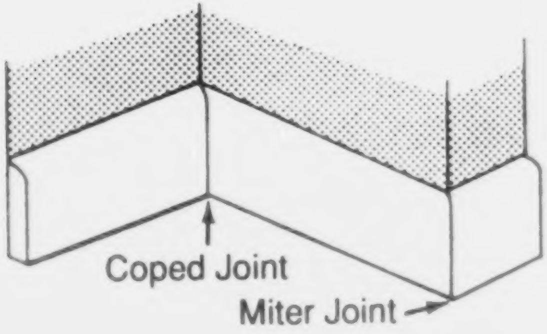
Door and Window Stops



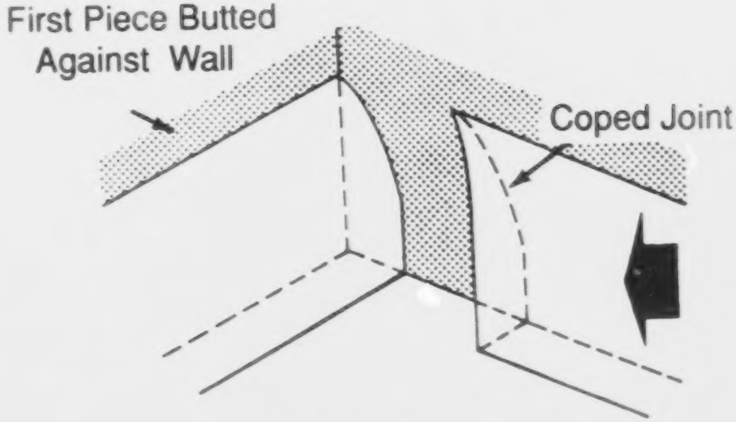
Corner Mold

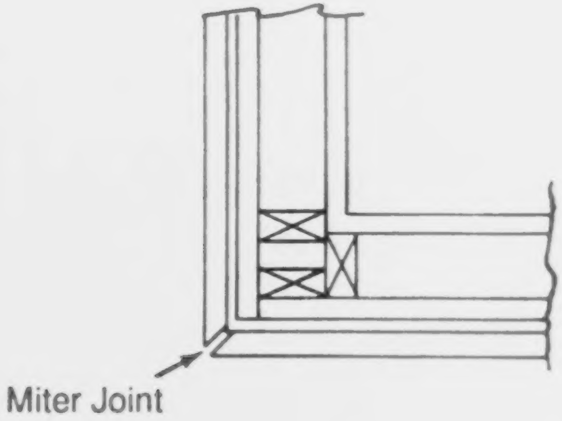
TM 1

Common Trim and Molding


Coped Joint
Miter Joint

CFP 337


First Piece Butted Against Wall
Coped Joint


Miter Joint

TM 2

JS 1

INSTALL DOOR TRIM

Equipment:

Miter saw
Hammer
1/16 nail set
4d, 6d finishing nails
Casing
Try-square
Tape measure
Trim material

Procedure:

Evaluation
3 2 1 N

1. Measure from the floor to the face of the head jamb. Add 3/16 inch to this measurement. This is the casing length to the heel of the miter cut. ___ ___ ___ ___

   (Note: The 3/16 inch is for the setback of the casing.)

2. Cut a pair of side casings for each side of the door. ___ ___ ___ ___

   (Note: Cut 45-degree miters. One casing needs a right-hand miter, the other a left-hand miter.)

3. Measure between the two side jambs and add 3/8 inch. This is the length to the heel of the 45-degree miter cuts. ___ ___ ___ ___

4. Make a miter cut for each side of door. ___ ___ ___ ___

   (Note: Make a right- and left-hand cut on each casing.)

5. Nail the head casing in place maintaining 3/16 inch setback at all points. Use 4d finishing nails to attach casing to the frame only. ___ ___ ___ ___

6. Install the side casing to the frame with 4d finishing nails spaced approximately 10 inches apart. ___ ___ ___ ___

   (Note: Be careful not to nail too close to the end of the casing. It could split.)

7. Use 4d finishing nails to fasten 45 degree corner miters together. ___ ___ ___ ___

8. Nail the entire casing to the wall frame with 6d finishing nails and set all nail heads with the nail set. ___ ___ ___ ___

   (Note: Use caution when nailing the corner miters. They must fit together tightly.)

9. Have instructor check your work. ___ ___ ___ ___

10. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials. ___ ___ ___ ___

Average of above evaluations* ___ ___ ___ ___

***This average is the student's partial evaluation for competency E-8 of Building Maintenance.**

JS 2

INSTALL WINDOW TRIM

Equipment:

Miter saw
Hammer
Plane
1/16 nail set
4d, 6d finishing nails
Casing
Apron
Try-square
Tape measure
Trim material
Stools

Procedure:

Evaluation
3 2 1 N

1. Measure between the side jambs. Add five inches to that measurement and cut the stool and apron to that length. ___ ___ ___ ___

2. Hold the stool in place centered under the window frame. ___ ___ ___ ___

3. Use the try-square and mark a square cut along the inside face of each jamb. ___ ___ ___ ___

4. Cut out the jamb to the depth of the notch in bottom of the stool. This will allow the stool to fit between the jambs. ___ ___ ___ ___

5. Close the windows and mark the stool where the window strikes it. ___ ___ ___ ___

6. Rip off this portion of the stool and plane smooth to fit the window. ___ ___ ___ ___

7. Install the stool and apron using 6d finishing nails. ___ ___ ___ ___

   (Note: Make sure the apron supports the stool in such a way that the top surface of the stool is level.)

8. Measure and cut the head casing. Measure between the side jambs. Cut a head casing this length, measured heel to heel of right- and left-hand miter cuts. ___ ___ ___ ___

9. Measure and cut side casings. Measure from the top of the stool to the face of the head jamb. This is the length to the heel of 45 degree miter cuts on the side casings. ___ ___ ___ ___

10. Install the casings. Nail the head and side casings to the window frame with 4d finishing nails. Use 6d finishing nails to fasten the casings to the wall frame. Set the nail heads with the nail set. ___ ___ ___ ___

11. Have instructor check your work. ___ ___ ___ ___

12. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials. ___ ___ ___ ___

Average of above evaluations* ___ ___ ___ ___

*This average is the student's partial evaluation for competency E-8 of Building Maintenance.

INSTALL FINAL TRIM TO WINDOWS AND DOORS

Equipment:

Miter saw
Hammer
1/16 nail set
4d finishing nails
Try-square
Tape measure
Trim material
Door and window stops

Procedure: Evaluation
3 2 1 N

1. Cut the side door stop a length equal to the distance from the floor to the face of the header jamb. Make one left and one right 45 degree miter cuts. ___ ___ ___ ___

2. The length of the header door stop is determined by measuring between the two 45 degree miter joints on the side jamb. ___ ___ ___ ___

3. Install with the door closed snugly against the door stops. Use 4d finishing nails. ___ ___ ___ ___

4. Cut the window side stop a length equal to the distance from the top of the stool to the face of the head jambs. ___ ___ ___ ___

5. Cut the header window stop a length equal to the distance from toe to toe between the 45 degree miter joints on the face of the side jambs. ___ ___ ___ ___

6. Install the stops with the window closed. Use 4d finishing nails. Install snugly against the window. ___ ___ ___ ___

7. Set nail heads with nail set. ___ ___ ___ ___

8. Have instructor check your work. ___ ___ ___ ___

9. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials. ___ ___ ___ ___

Average of above evaluations* ___ ___ ___ ___
***This average is the student's** partial evaluation for competency **E-8 of Building Maintenance.**

JS 4

CUT AND INSTALL BASEBOARD AND TRIM

Equipment:

Miter saw
Hammer
1/16 nail set
2d, 6d finishing nails
Try-square
3/8-inch square blocks
Tape measure
Trim material

Procedure:

Evaluation
3 2 1 N

1. Start with a wall that ends in two inside corner joints. ___ ___ ___ ___

2. Measure the distance between the walls. Cut the baseboard this length, using square end cuts. ___ ___ ___ ___

3. Locate the wall studs and mark their location on the floor. ___ ___ ___ ___

4. Place 3/8-inch spacer blocks and nail to the wall approximately 4 feet apart. Place one block in each corner. ___ ___ ___ ___

5. Set the baseboard on the blocks and nail to the studs with 2d and 6d finishing nails. ___ ___ ___ ___

6. Cut the inside corner joint on the next length of baseboard. Make a coped joint on one end of the board by making a 40 degree miter cut. Cope off the wood on the back side of the miter cut until the joint mates smoothly with the face of the previously installed baseboard. ___ ___ ___ ___

7. If the next corner joint also is an inside corner, cut the board to length with a square cut. ___ ___ ___ ___

   (Note: If the wall is interrupted by a door opening, cut the baseboard to length but avoid a tight fit that pushes the door casing out of position.)

8. Cut the outside corner joint. Outside corners require a 45 degree miter cut on the joining ends of the two pieces of baseboard that meet to form the corner. ___ ___ ___ ___

9. Install final trim after all baseboard is installed and the finished covering has been added to the floor. Nail base shoe or quarter round trim material in place to cover gaps between baseboard and floor covering. Use the same techniques to make the joints as used with baseboard. ___ ___ ___ ___

10. Have instructor check your work. ___ ___ ___ ___

11. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials. ___ ___ ___ ___

Average of above evaluations* ___ ___ ___ ___

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*This average is the student's partial evaluation for competency E-8 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

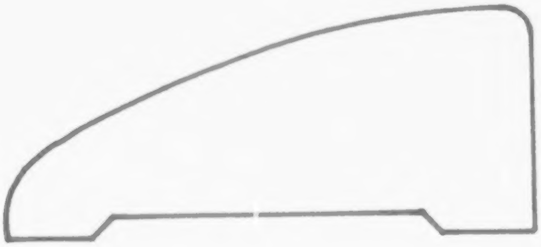
LESSON 6: INTERIOR FINISHING

LESSON TEST

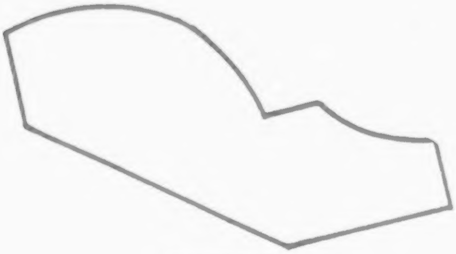
Part 1. Identify each type of molding from the list below. Place the correct letter in each blank.

A. Casing
B. Cove mold
C. Baseboard
D. Door and window stops
E. Corner mold
AB. Base shoe
AC. Quarter round
AD. Bed mold

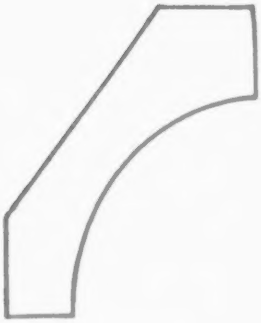
______ 1.



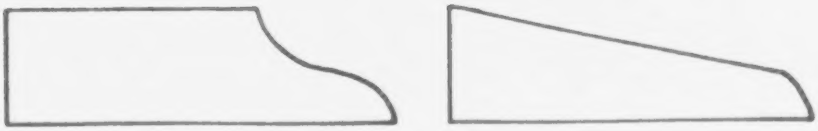
______ 2.



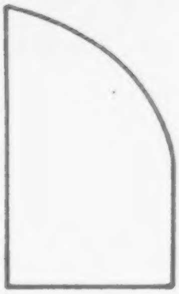
______ 3.



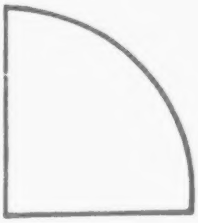
______ 4.



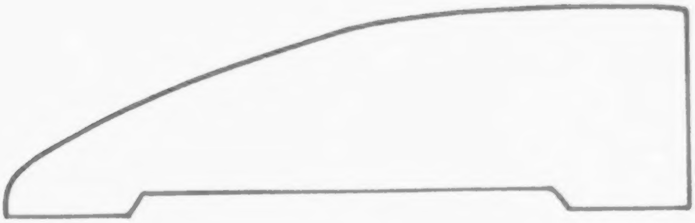
______ 5.



______ 6.



______ 7.



_____ 8.

Part 2. Choose the correct definition for each term below and place its letter on the blank.

A. Cope

B. Miter joint

_____ 9. The joining of two pieces by making a cut in each piece that bisects the joining angle--for example, the 45-degree joint where the side and head casing of a door frame meet

_____ 10. To cut or shape the end of a piece of molding so it will cover and fit the contour of an adjoining piece of molding at a joint

Part 3.

11. Describe an easy method of determining whether a door is a right- or left-hand door.

MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT II, LESSON 6 TEST

Part 1.

1. A
2. AD
3. B
4. D
5. AB
6. AC
7. C
8. E

Part 2.

9. B
10. A

Part 3.

11. If the door swings into the room from outside, face the door from the outside. The direction the door swings indicates right- or left-hand door.

If the door swings out of the room, face the door from the outside. The direction the door swings is right-hand reverse or left-hand reverse.

OR

An easy method to determine the hand of a door is to stand in the open door with your back to the hinge joint. Open the door. If it opens to your left, it is a left-hand door. If it opens to your right, it is a right-hand door.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 7: INSTALL OR REPLACE CERAMIC TILE

LESSON OBJECTIVE

After completion of this lesson the student will be able to KNOW THE PROCEDURES FOR LAYING CERAMIC TILE AND IDENTIFY THE DIFFERENT PATTERNS AND TRIM TILE. Mastery will be evidenced by scoring __________ percent on the lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Select the different types of trim tile.
2. Identify tile patterns.
3. Select the correct tools for the job.
4. Select the right adhesives for the right underlayment.

Completion of the requirements of this lesson fulfills competency E-9 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 7: INSTALL OR REPLACE CERAMIC TILE

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Transparency masters
  1. Tile patterns
  2. Substrates and adhesives

D. Lesson test

E. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 7: INSTALL OR REPLACE CERAMIC TILE

INFORMATION OUTLINE

I. Terms and definitions

A. Back buttering--applying mortar or adhesive directly to the back of a tile

B. Backer board--a concrete panel composed of portland cement, aggregate and glass fiber reinforcement

C. Dry set mortar--a mixture of cement, sand and other additives, commonly referred to as "thin set" mortar; applied in a thin layer to attach tiles to the substrate

D. Drywall, sheetrock, gypsum board, wallboard--the standard material for walls in new construction. It has a plaster core and paper on either side

E. Greenboard--a type of drywall for use in wet areas

F. Glaze--a surface coating applied to the tile prior to the firing process

G. Grout--a mixture of sand and cement used to fill the joints between the tiles

H. Latex additive--a liquid that is often added to mortar or grout to improve strength and flexibility

I. Mortar bed--a mixture of sand, cement and water, commonly referred to as a "mud bed" applied as a thick layer (1-1/4") to create a firm underlayment for tiles

J. Mosaic tile--smaller porcelain-type tiles (typically 1-2" square) with the color throughout the tile body

K. Organic mastic--a type of adhesive that is pre-mixed and ready to use; suitable for residential floors

L. Pressure coat, skim coat--the first step in applying in a mortar of adhesive. In this step, the mortar is spread across the underlayment using the flat side of the trowel. This results in good contact between the substrate and mortar

M. Quarry tile--a strong, durable tile made from natural clay and shale (usually 1/2" thick); used mostly for floors

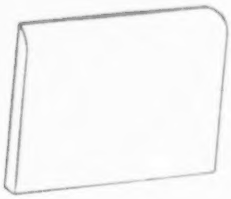
N. Slaking--allowing mortar or grout to sit for ten minutes after being mixed to allow all ingredients to react

O. Subfloor--the layer of a floor that rests directly on the floor joists (typically this is 1/2" plywood)

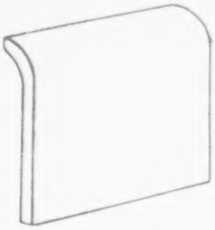
P. Underlayment--the supporting surface of a tile installation to which the tile is applied, also called the "substrate"

II. Trim tiles (TM 1)

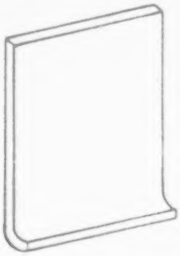
A. Bullnose tile
   1. One of the most common trim tiles
   2. It has one rounded edge and is used to make a finished edge on a field of tile
   3. Can be used on walls and floors



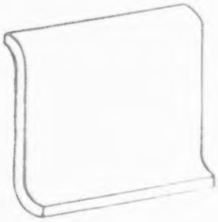
B. Thick-set bullnose tile
   1. Used in situations where a thick-set underlayment is used
   2. A thick-set bullnose tile will make the transition to the level of the adjacent area
   3. These are often used at the edge of a tiled floor area that has been raised by a mortar bed



C. Cove tile
   1. A cove tile makes a transition between a tiled wall and a tiled floor

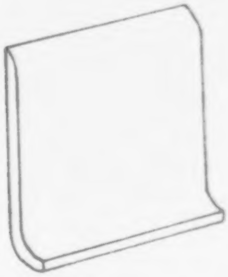


D. Cove base-tile
   1. Used at the edge of a floor where the wall is not tiled
   2. It brings the tile surface partially up to the wall



E. Thick-set cove-base tile

1. Available to accommodate a thick-set installation



III. Materials needed for ceramic tile projects--your project may not require every item

A. Sheets of backer board

B. Sheets of plywood underlayment

C. Sand and cement for mud bed

D. Tar paper

E. Wire lath

F. Filed tiles

G. Bullnose tiles

H. Ceramic shoe base

I. Special trim tiles

J. Galvanized nails

K. Galvanized screws

L. Thin set mortar

M. Organic mastic adhesive

N. Latex additive for mortar

O. Grout

P. Latex additive for grout

Q. Latex grout film remover

R. Caulk

S. Greenboard

T. Drywall screws

U. Drywall mud

V. Seam tape

IV. Tools for ceramic tile projects

Installing ceramic tile requires some standard, all-purpose tools as well as some specialized tools--since you may not need to use the special tools once the project is completed, ask your tile supplier if they can be loaned or rented

A. Tape measure

B. Graph paper

C. Tracing paper

D. Ruler

E. 4-foot level

F. Combination square

G. Backer board cutter

H. Hammer

I. Utility knife

J. Drywall T-square

K. Electric screw gun

L. Jamb saw

M. Buckets

N. Margin trowel

O. Square-notched trowel

P. V-notched trowel

Q. Putty knife

R. Tile cutter

S. Tub saw

T. Carbide-tipped hole saw bit

U. Tile nippers

V. Rod saw

W. Vacuum cleaner

X. Floor grout float

Y. Wall grout float

Z. Blanket scraps

AA. Sponge

BB. Abrasive pad

CC. Towels

DD. Caulking gun

V. Underlayments (TM 2)

A. The underlayment or substrate is part of the tile project that the do-it-yourselfer is most likely to overlook

B. A mortar (or "mud") bed is by far the best underlayment for tile--mortar beds are also used as underlayments for wall tiles--however, even a small mud bed may be more work than you want to undertake

C. Backer board (often referred to as "mortar board" or by the brand name "Wonder Board") is probably the best type of underlayment for the do-it-yourselfer--in addition to floor applications, it can also be used on walls, especially in high-moisture situations

D. For floors, the combination of wooden subfloor and backer board should be at least 1 1/4 inches thick --one layer of backer board, drywall or greenboard is sufficient for most wall applications

E. Wood underlayments are also an option--two layers of plywood, adding up to at least 1 1/4 inches will work --the top layer should be an exterior grade (a wood underlayment, however, is not officially recommended by industry standards groups with dry-set mortar)

F. Existing ceramic tile or vinyl floors may also work as underlayments--the floor must be solid and stable If the floor is cushioned vinyl or linoleum, or has more than one layer of either of these materials, it should be removed and another underlayment installed

G. A concrete slab or masonry wall is an excellent substrate for tile--the surface must be clean and free of cracks--however, some concrete slabs include chemicals that ruin the bond with the tile adhesives--

check with a professional

H. Never put tile over wooden plank flooring, composition board or masonite

VI. Tips from the pros

A. Try to get tiles from the same manufacturing lots--the lot number will usually be marked on the box--there may be slight variations in the color of the tiles from batch to batch--if you must use tiles from different lots, mix the tiles up before installing

B. Choosing white grout is just asking for trouble, particularly on floors--white will show up dirt and stains significantly more than a darker shade that complements the colors of the tiles

C. Save the large scraps of cut tiles--you may be able to use them for cut pieces elsewhere in the project

D. Make sure that all the materials are at room temperature when you use them--some adhesives and mortars won't work if they are too cold--in addition, the movement of materials as they expand or contract to reach room temperature can break adhesive bonds

E. When choosing tile, don't rely on catalog chip samples --these colors can be misleading--look at actual samples of the tiles

F. Try to bring tile samples to the site to see exactly how the tile will fit into the surroundings--the nature of the light in a room can change the appearances of a tile--look at the tile during the day under sunlight, and at night with the appropriate lights on

G. There are two methods for estimating the amount of tile you need for a project

1. One way is the square-footage method--take the total area to be covered--add 10 percent for cut tiles, waste and replacements, and divide by the coverage of one box of tiles--be aware that very few till suppliers will sell a partial box

$$\frac{\text{Area (square feet) + 10\%}}{\text{Square feet per box}}$$

2. The other method is to make an exact diagram of where each tile will go in the layout and count the exact number needed. You can determine exactly how many field tiles, how many cut tiles, and how many trim tiles you will need. You still need to order extra tiles for damage and replacements. This method may give more accurate results if your project has a lot of cut tiles of a complicated pattern in an accent color.

Substrates & Adhesives

Floor and Countertop Setting Materials

Plywood	Mud Bed or Concrete Slab	Existing Tile	Existing Vinyl or Linoleum[1]	Backer Board	Formica (Countertop only)
Type 1 Adhesive Epoxy Mortar	Type 1 Adhesive[2] Epoxy Mortar Dry Set Mortar[3]	Type 1 Adhesive Epoxy Adhesive	Epoxy Adhesive	Type 1 Adhesive Dry Set Mortar	Type 1 Adhesive Epoxy Adhesive

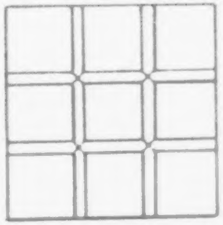
[1] Install tile only if material is non-resilient.
[2] Don't use Type 1 Adhesive for concrete slab below grade.
[3] Dry Set Mortar can also contain a latex additive.

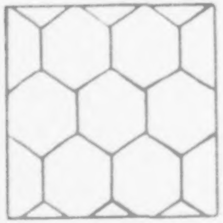
Interior Wall Setting Materials

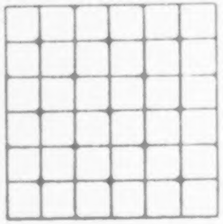
Drywall	Greenboard	Cement Block, Concrete, or Backer Board	Dry Portland Cement/ Plaster	Tile, Formica or Painted Surfaces	Mud Bed
Type 1 Adhesive Type 2 Adhesive[4] Dry Set Mortar	Type 1 Adhesive Dry Set Mortar	Type 1 Adhesive Dry Set Mortar	Type 1 Adhesive Dry Set Mortar	Type 1 Adhesive Epoxy Adhesive	Dry Set Mortar

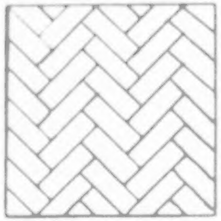
[4] Use Type 2 Adhesive only in dry areas.

Tile Patterns

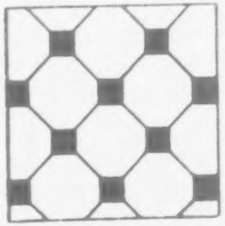

Pickets with Squares

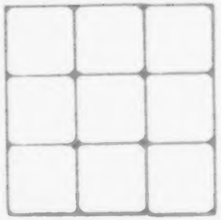

Hexagons

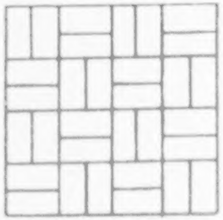

Hexagons and Dots

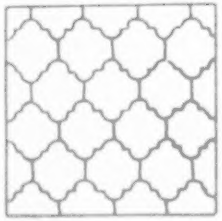

Herringbone

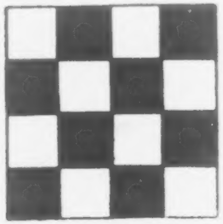
CFP 369

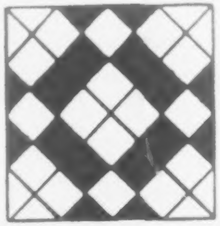

Octagons and Dots

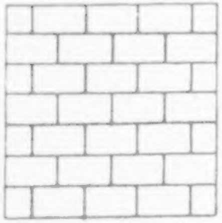

Octagons and Dots

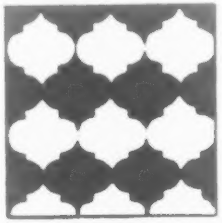

Basketweave


Provençal or Ogee


Checkerboard


Diagonal Checkerboard


Staggered Brick


Provençal or Ogee

TM 2

Illustrations courtesy of The Tile Council of America and The Italian Tile Council

MODULE: CARPENTRY AND BUILDING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 7: INSTALL OR REPLACE CERAMIC TILE

LESSON TEST

Part 1. Place a "T" in the blank beside each true statement concerning ceramic tile. Place an "F" in the blank beside each false statement.

______ 1. There is only one type of trim tile.

______ 2. A cove tile makes a transition between a tiled wall and a tiled floor.

______ 3. The most common trim is the bull-nose tile.

______ 4. Underlayment is the surface to which the tile is laid.

______ 5. One type of adhesive is satisfactory for all types of underlayments.

______ 6. You may use ceramic tile on walls as well as floors.

______ 7. There are many patterns of tile placement from which to choose.

______ 8. The subfloor and underlayment should be at least 2 inches thick.

______ 9. You will have to estimate the number of tiles you will need because there is no accurate way to measure it.

______ 10. Ceramic tile must be grouted.

Part 2. Choose the answer that best completes each statement.

______ 11. Greenboard is:

A. A surface coating applied to the tile prior to the finishing process

B. A type of drywall for use in wet areas

C. A mixture of sand and cement used to fill

_____ 12. Ceramic tile subfloor and underlayment should be at least ___________ thick.

A. 1/2 inch

B. 2 1/2 inches

C. 1 1/2 inches

_____ 13. Use a __________ to cut ceramic tile.

A. Glass cutter

B. Tile cutter

C. Saw

_____ 14. To figure how much tile you need, you can

A. Estimate

B. Measure the square feet to be covered

C. Buy a lot

_____ 15. On a mud bed wall, you use which adhesive?

A. Epoxy adhesive

B. Type 1 adhesive

C. Dry-set mortar

_____ 16. The lot number on the box tells you

A. Color of that batch

B. How many tiles are in the box

C. Where you can use those particular tiles

_____ 17. Grout is used to

A. Glue the tile to the surface

B. Fill the joints between the tiles

C. Make the tile shine

_____ 18. Back buttering is

A. A concrete panel composed of portland cement

B. Applying mortar of adhesive directly to the back of a tile

C. A type of adhesive used on tiles

_____ 19. Tile should be laid at

A. Room temperature

B. Any temperature

C. Cold temperature

_____ 20. When using Type 2 adhesive the area should be

A. Wet

B. Dry

C. Either A or B

MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT II, LESSON 7 TEST

Part 1.

1. F
2. T
3. T
4. T
5. F
6. T
7. T
8. F
9. F
10. T

Part 2.

11. B
12. C
13. B
14. B
15. C
16. A
17. B
18. B
19. A
20. B

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 8: WALL FRAMING

LESSON OBJECTIVE

After completion of this lesson, the student will be able to CONSTRUCT AND LAY OUT A WALL WITH ROUGH OPENINGS. Mastery will be evidenced by completion of a job sheet and by scoring __________ percent on the lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Match terms associated with wall framing to their definitions.
2. Identify each of the parts of wall framing.
3. Match the terms associated with wall layout to the correct definitions.
4. Identify each of the parts of a wall.
5. Point out the correct rules to follow when laying out walls.
6. Name the two types of rough openings in a wall.
7. Lay out a wall.
8. Frame a wall.

Completion of the requirements of this lesson fulfills competency E-7 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 8: WALL FRAMING

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Job sheets
    1. Lay out a wall
    2. Frame a wall

D. Lesson test

E. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

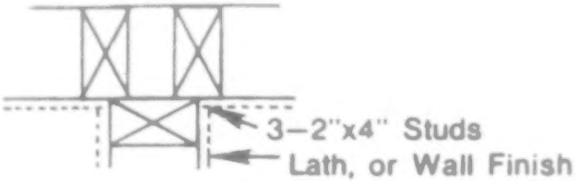
UNIT II: INTERIOR CARPENTRY

LESSON 8: WALL FRAMING

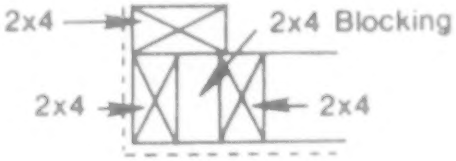
INFORMATION OUTLINE

I. Terms and definitions

A. "T" or wall intersection--three studs and three blocks constructed to form two walls joining at a 90-degree angle providing a nailing surface for five walls



B. Corner--three studs and three blocks constructed to form two walls joining at a 90-degree angle, providing nailing surfaces on all sides



C. Stud--a piece of dimension lumber (2x4 or 2x6) used to form the upright members of wall framing

D. Header--the framing member in a wall over a door or window

(Note: It is usually a 2x6 or 2x12)

E. Trimmer--the framing member on either side of a door or window opening on which the headers sit

F. Cripple--dimension lumber used above and below the rough window openings to add strength to the wall and to provide nailing surfaces

G. Bottom plate--the bottom portion of a wall running horizontally, onto which studs are nailed and then secured to the floor (sometimes called a sole plate)

H. Top plate--the top piece of a wall to which the studs are nailed

I. Double plate--an extra piece of lumber placed on the top of the top plate to add strength and keep the wall straight

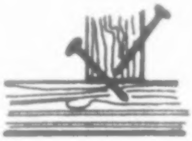
J. Rough sill--the framing member in a wall

K. Rough opening--the opening formed by the framing members for windows and doors

L. Partition--a wall that subdivides space within a building. Inner wall for bedrooms, baths, etc.

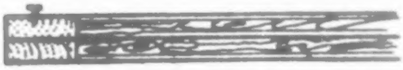
M. Prefabricate--to build at a factory or shop for use or to be carried to the job site

N. Toenail--nailing boards to an adjoining board by nailing from the side of the board



O. Plumb--a true vertical line

P. Tack--used with temporary bracing where the nails are not driven completely into the wood



II. Parts of a wall

  - A. Studs
  - B. Corners
  - C. "T"s
  - D. Trimmers
  - E. Cripples
  - F. Headers
  - G. Sole or bottom plate
  - H. Top plate
  - I. Double plate
  - J. Doors
  - K. Windows

III. Layout rules

  - A. Lay out bottom and top plates at the same time
  - B. Never run your hands along the edges of the plates
  - C. Be sure of the location of the first stud
  - D. Mark entire length of wall for studs location
  - E. Mark location for rough openings
  - F. Mark location of "T"s and corners

IV. Types of rough openings

  - A. Doors
    1. Allow for door jambs during layout
    2. Allow for proper alignment
  - B. Windows
    1. Aluminum
    2. Wood
    3. Plate glass

LAY OUT A WALL

Equipment:

Framing square
Steel tape
Pencil
Plans or blueprint
Handsaw
Eye protection

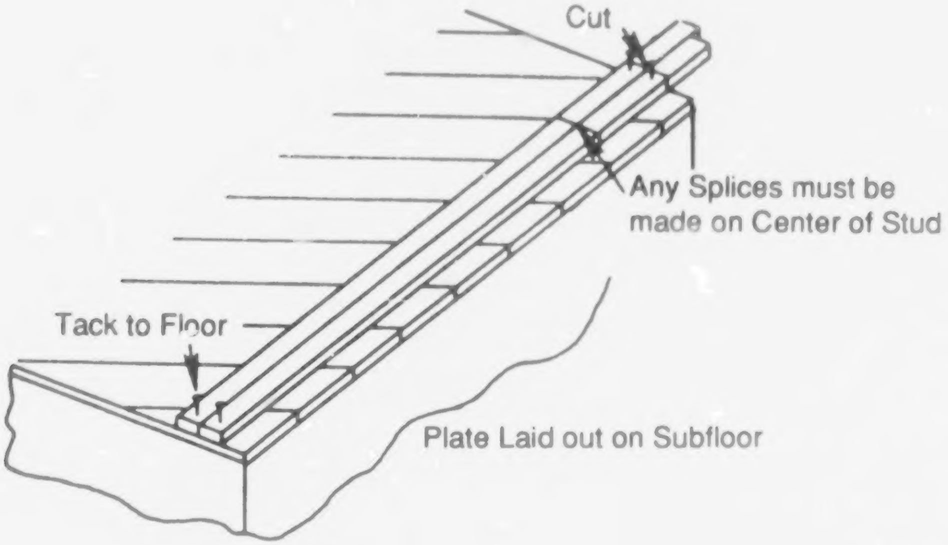
Procedure:

Evaluation
3 2 1 N

1. Select 2" x 4" lumber for plates. ___ ___ ___ ___

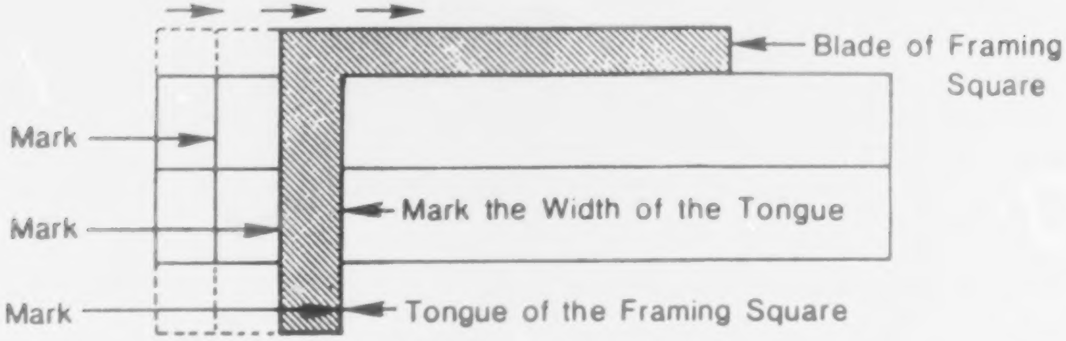
   (Note: Use straight 2" x 4" lumber for the top plate.)

2. Place both top and sole plates together for layout. ___ ___ ___ ___


Cut
Any Splices must be made on Center of Stud
Tack to Floor
Plate Laid out on Subfloor

3. Mark the plates for the corner studs. ____

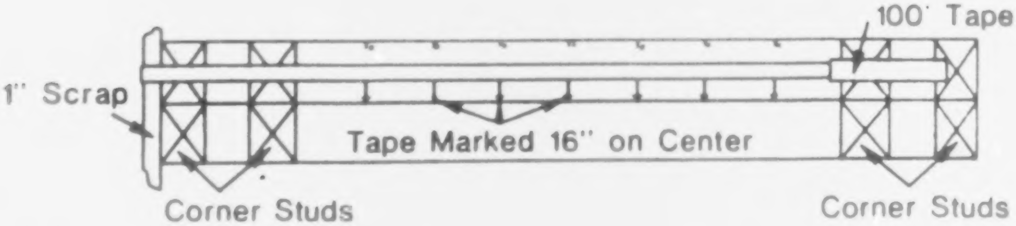
(Note: Use the framing square to mark studs width.)



Blade of Framing Square
Mark
Mark
Mark the Width of the Tongue
Mark
Tongue of the Framing Square

4. Mark stud locations on both plates at the same time. ____

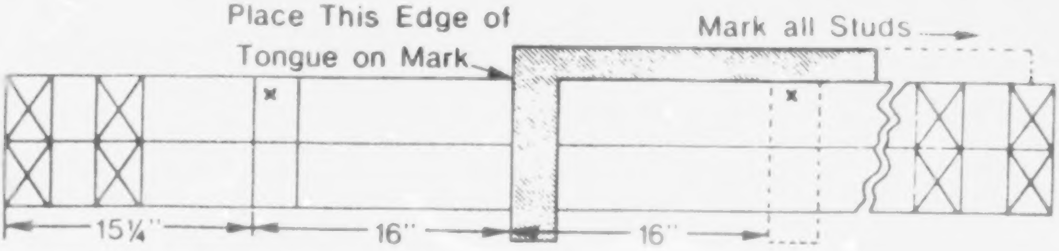
(Note: The first stud should be on 15 1/4" centers, not 16".)



100' Tape
1" Scrap
Tape Marked 16" on Center
Corner Studs
Corner Studs

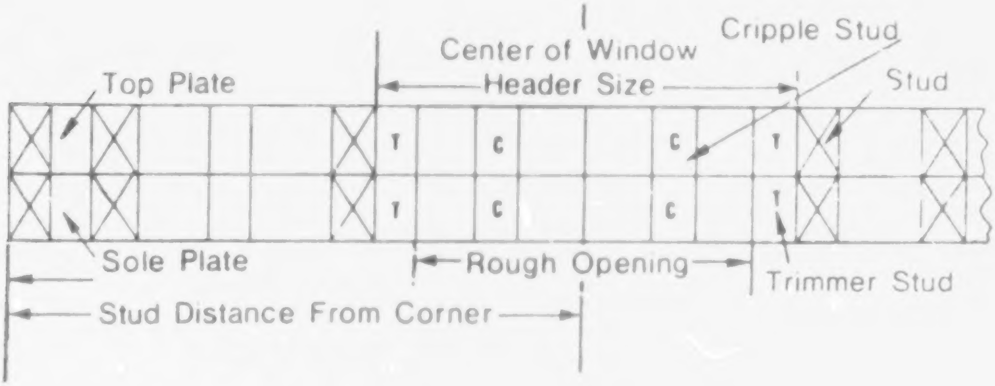
5. Use framing square to draw lines indicating stud location. ______

(Note: Mark an "X" to the right of each line to show stud location.)


Place This Edge of Tongue on Mark
Mark all Studs
x
x
15¼"
16"
16"

6. Mark rough opening locations. ______

(Note: Check actual sizes of windows/doors.)


Center of Window
Cripple Stud
Top Plate
Header Size
Stud
T
C
C
T
T
C
C
T
Sole Plate
Rough Opening
Trimmer Stud
Stud Distance From Corner

7. Have instructor check your work. ______

8. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials. ______

Average of above evaluations* ______

*This average is the student's partial evaluation for competency E-10 of Building Maintenance.

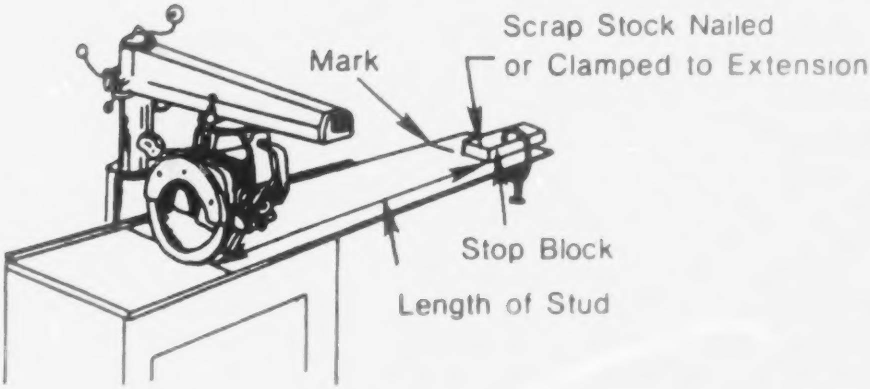
FRAME A WALL

Equipment:

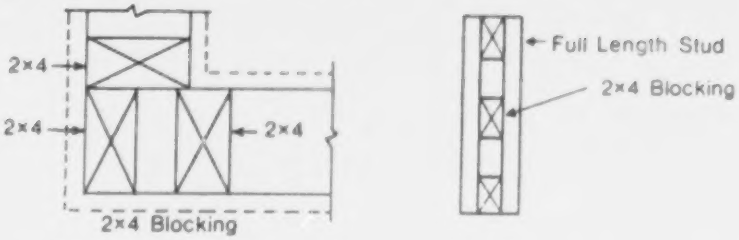
Table or radial arm saw
13 oz. hammer
Framing square
50-foot tape
16d nails
Blueprint
Materials according to the blueprint
Pencil
Eye protection

Procedure:

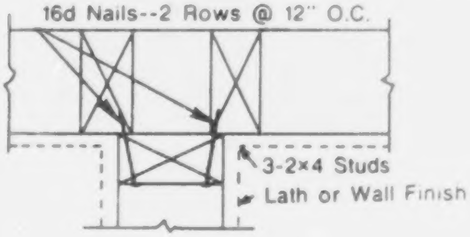
	Evaluation			
	3	2	1	N
1. Follow the steps outlined in Job Sheet #1 for wall layout.				
2. Determine the number of studs needed for the sill plate.				
3. Determine the length of the studs from the blueprint.				
4. Set up the saw and cut studs to length.				


Mark
Scrap Stock Nailed or Clamped to Extension
Stop Block
Length of Stud

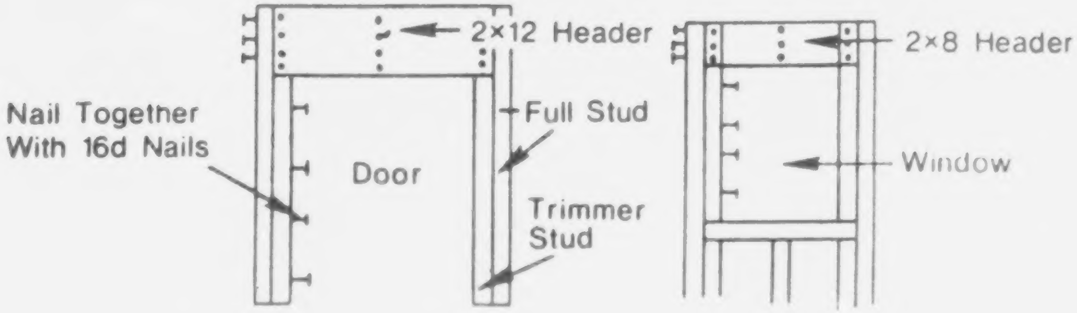
5. Build the corners for the wall. ____


2×4
2×4
2×4
2×4 Blocking
Full Length Stud
2×4 Blocking

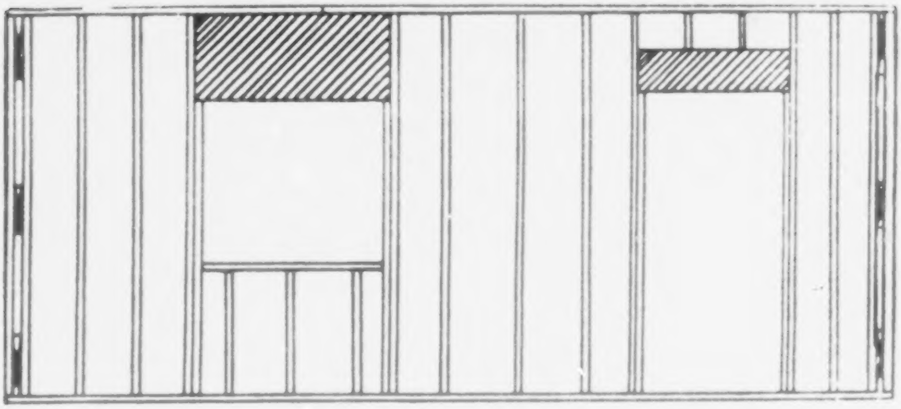
6. Build any "T"s for the wall. ____


16d Nails--2 Rows @ 12" O.C.
3-2×4 Studs
Lath or Wall Finish

7. Build any door or window openings. ____


2×12 Header
Nail Together With 16d Nails
Full Stud
Door
Trimmer Stud
2×8 Header
Window

8. Nail studs, corners, door and window openings to bottom and top plates. ____



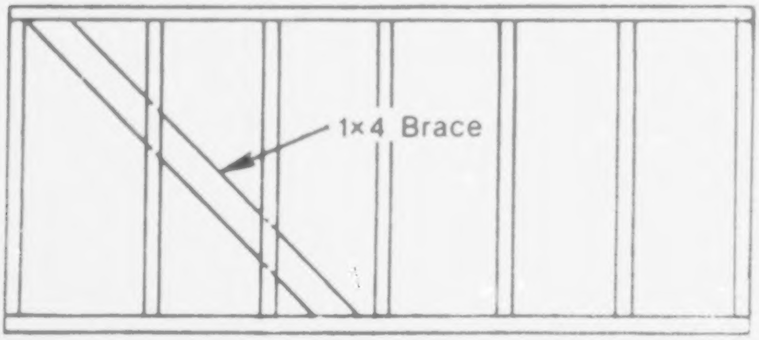
9. Figure number of rough sills and cripples for window openings. ____

10. Cut rough sills and cripples to length. ____

11. Nail rough sills and cripples in place. ____

12. Measure and cut diagonal wind braces. ____

13. Nail wind braces in place. ____



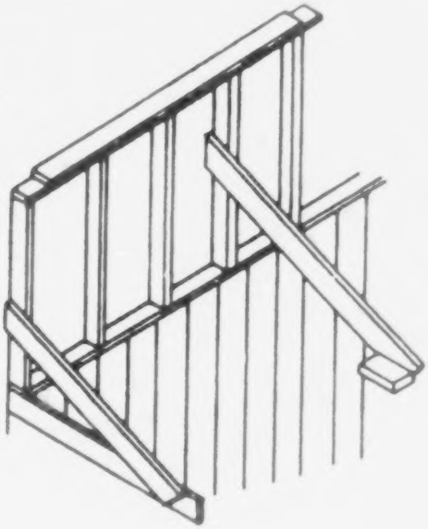
14. Cut several braces to secure wall when raising.

15. Tack braces in place on wall.

16. Raise wall.

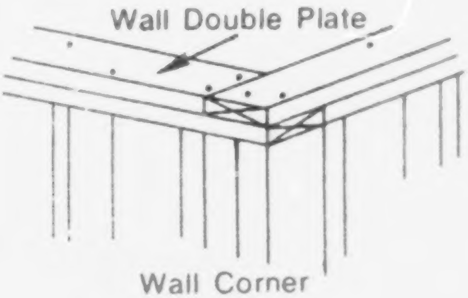
(CAUTION: Be sure to have enough people to
raise the wall safely.)

17. Secure the temporary braces to the floor or outside the building.



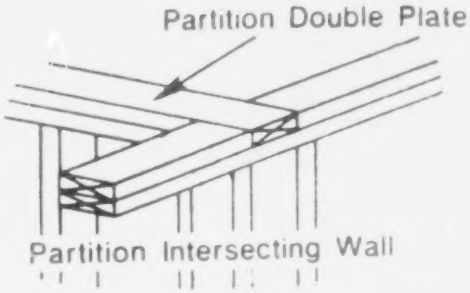
18. Repeat these same procedures on other walls.

19. Tack corners and "T"s together at wall intersections.



Wall Corner

20. Nail double plates in place. ___ ___ ___ ___


Partition Double Plate
Partition
Intersecting Wall

21. Plumb all walls. ___ ___ ___ ___

22. Nail all wind braces, corners, and "T"s securely. ___ ___ ___ ___

23. Add any temporary braces necessary. ___ ___ ___ ___

24. Have instructor check your work. ___ ___ ___ ___

25. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials. ___ ___ ___ ___

Average of above evaluations* ___ ___ ___ ___

*This average is the student's partial evaluation for competency E-7 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 8: WALL FRAMING

LESSON TEST

Part 1. Match the terms associated with wall layout to the correct definitions. Place the letter of each term in the correct blank.

A. "T"
B. Top plate
C. Stud
D. Cripple
E. Corner
AB. Double plate
AC. Header
AD. Bottom plate
AE. Trimmer

_____ 1. Three studs and three blocks constructed to form two walls joining at a 90-degree angle providing a nailing surface for five walls

_____ 2. Three studs and three blocks constructed to form two walls joining at a 90-degree angle, providing nailing surfaces on all sides

_____ 3. A piece of dimension lumber (2x4 or 2x6) used to form the upright members of wall framing

_____ 4. The framing member in a wall over a door or window

_____ 5. The framing member on either side of a door or window opening on which the headers sit

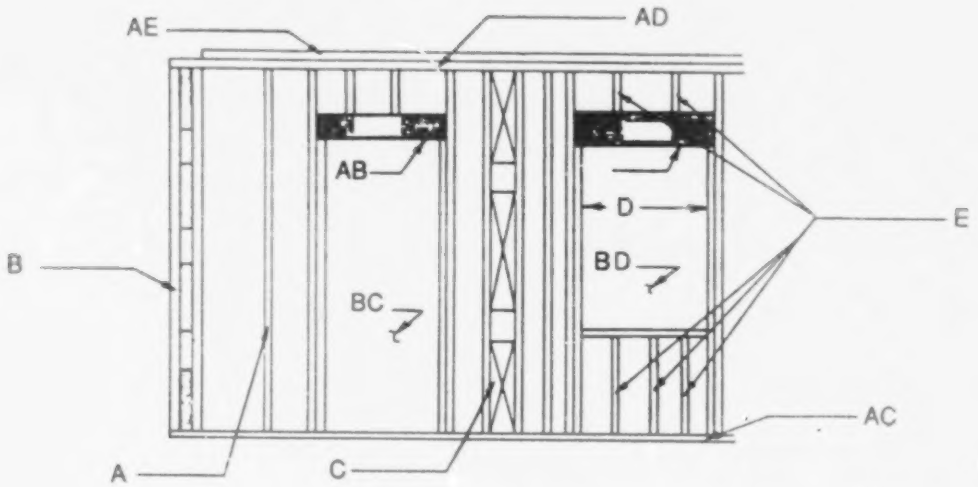
_____ 6. Dimension lumber used above and below the rough window openings to add strength to the wall and to provide nailing surfaces

_____ 7. The bottom portion of a wall running horizontally, onto which studs are nailed and then secured to the floor--sometimes called a sole plate

_____ 8. The top piece of a wall to which the studs are nailed

_____ 9. An extra piece of lumber placed on the top of the top plate to add strength and keep the wall straight

Part 2. Identify each part of a wall from the drawing below. Write the letter of each part on the blank next to its correct name.



_____ 10. Studs

_____ 11. Corner

_____ 12. "T"

_____ 13. Trimmer

_____ 14. Cripple

_____ 15. Header

_____ 16. Bottom plate

_____ 17. Top plate

_____ 18. Double plate

_____ 19. Rough opening for door

_____ 20. Rough opening for window

Part 3. **Point out the correct rules to follow when laying out walls by placing an "X" on the blank beside each true statement.**

______ 21. Lay out the top and bottom plates together

______ 22. Run your hands along the edges of the plates when marking stud locations

______ 23. The location of the first stud does not matter

______ 24. Mark the location for each stud on both plates at the same time

______ 25. Mark the location for doors and windows after the wall is set up

______ 26. Mark the location for "T"s and corners on both plates at the same time before the wall is put together

MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT II, LESSON 8 TEST

Part 1.

1. A
2. E
3. C
4. AC
5. AE
6. D
7. AD
8. B
9. AB

Part 2.

10. A
11. B
12. C
13. D
14. E
15. AB
16. AC
17. AD
18. AE
19. BC
20. K

Part 3.

21. X
22.
23.
24. X
25.
26. X

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 9: CLEAN AND FINISH FLOORS; CLEAN WALLS

LESSON OBJECTIVE

After completion of this lesson, the student will be able to CLEAN AND REFINISH FLOORS. Mastery will be evidenced by completion of job sheets.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Strip and re-wax a floor.
2. Clean a wall.

Completion of the requirements of this lesson fulfills competency E-11 and E-12 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

LESSON 9: CLEAN AND FINISH FLOORS; CLEAN WALLS

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Job sheets
  1. Strip and wax a floor
  2. Clean a wall

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT II: INTERIOR CARPENTRY

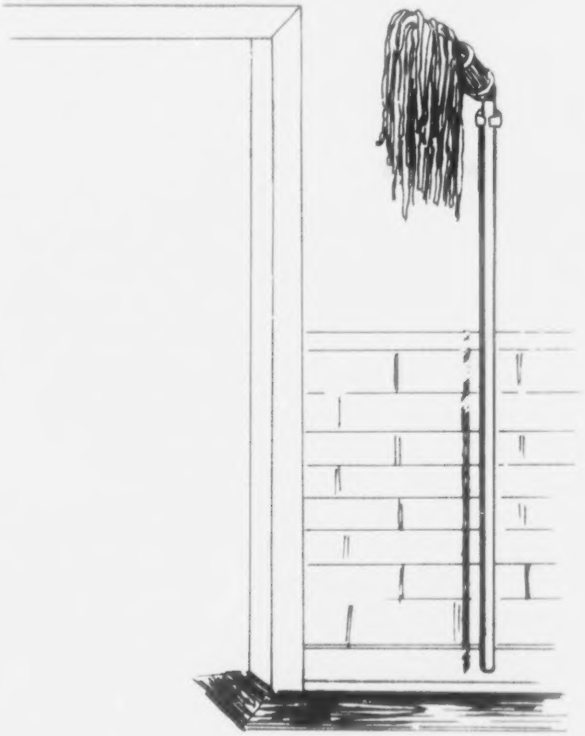
LESSON 9: CLEAN AND FINISH FLOORS; CLEAN WALLS

INFORMATION OUTLINE

I. Daily dust-mopping procedure

   A. Always treat the mop the day before and let it hang overnight with the silks down so the dressing will penetrate evenly

      (Note: Use the rule of 6 and 12. If you're treating a freshly laundered or new dust mop, divide 6 into the length of your mop to determine the number of ounces to be used. For example, if you're using a 36-inch mop, 6 divided into 36 would be 6 ounces of treatment. If you are retreating a used dust mop, divide 12 into the length of the mop.)

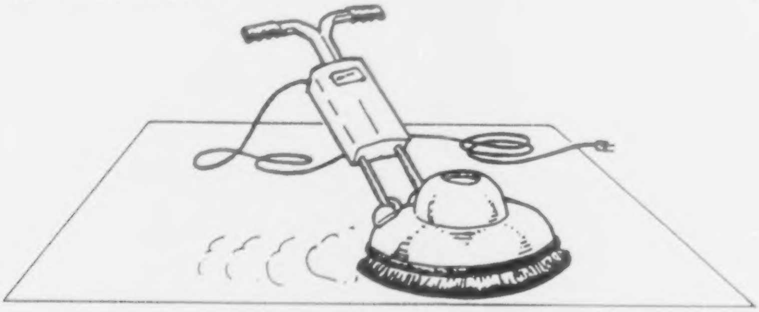


CLEAN, STRIP AND WAX A FLOOR

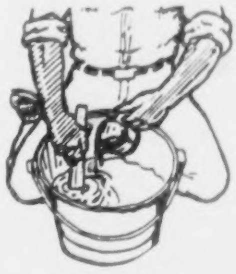
Equipment:

- Dust mop or push broom
- Towels
- Black strip pads
- Single-brush floor machine
- Mops and handles
- Mops buckets and wringers
- Measuring cup
- Wet vacuum
- Stripping solution

Procedure:	Evaluation 3	 2	 1	 N
1. If you need to strip, sweep away all loose dirt and trash.	___	___	___	___
2. Place Turkish toweling in all doorways and entryways.	___	___	___	___
3. Place a black strip pad under a single-brush machine and dry hone heavy buildup along edges and baseboards.	___	___	___	___

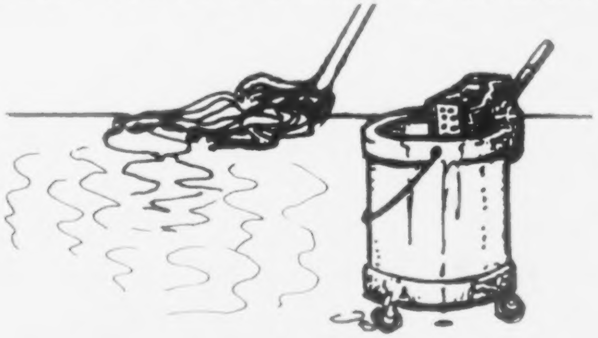


4. Mix stripper and water as directed. For extremely heavy buildup, increase dilution.	___	___	___	___

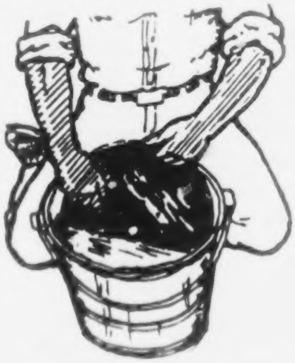


5. Apply a liberal amount of the stripper solution to an area approximately 10 feet by 20 feet.

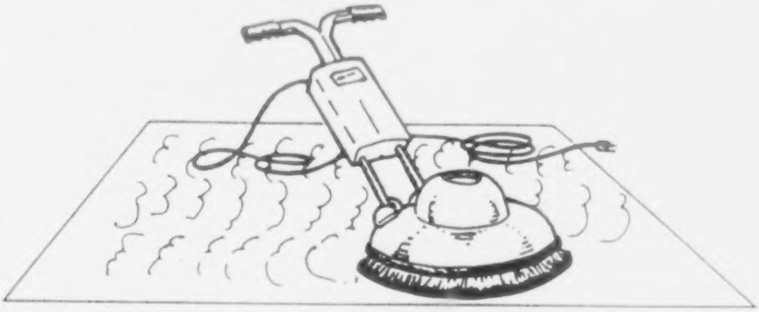
(Note: Do not let the stripper dry on the floor. Let it set for 5 to 10 minutes.)



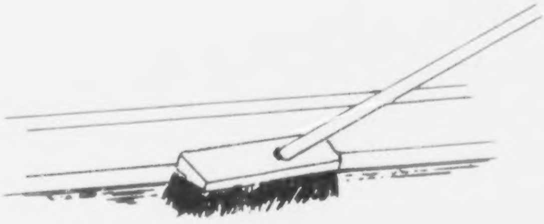
6. Place a black strip pad in the bucket of stripping solution. Slowly rotate the pad until it is saturated.



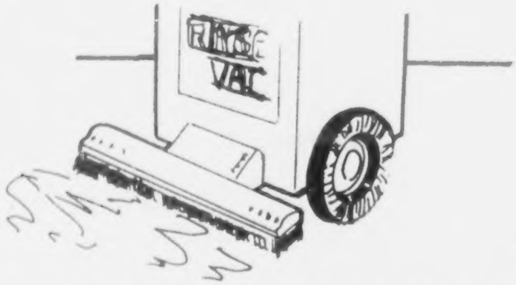
7. Place the saturated black strip pad under the single-brush floor machine and scrub the floor in a back-and-forth motion. Scrub in both directions to make sure all the old coating is removed.



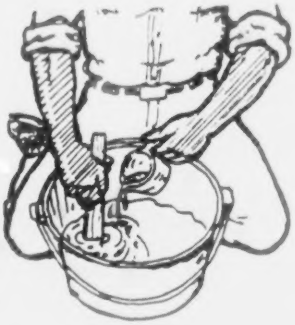
8. To remove buildup and dirt along baseboards, use an abrasive pad or brush.



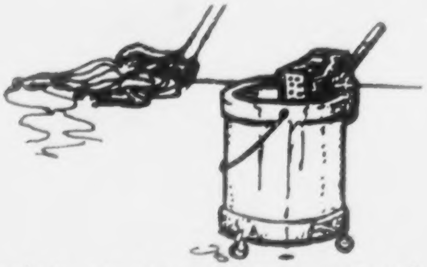
9. After each section has been scrubbed in both directions, pick up with a wet vac.



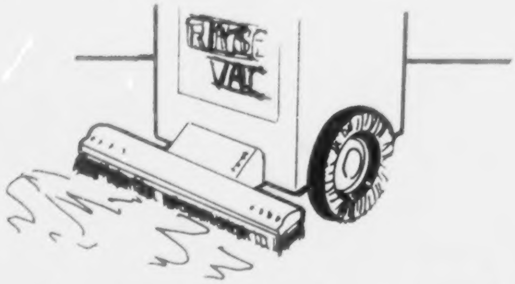
10. Mix a rinse solution according to directions to remove any alkaline residue left by the stripper.



11. Heavy rinse the section you just scrubbed. — — — —



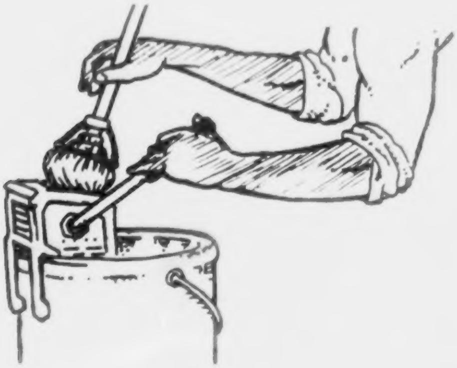
12. Immediately pick up the rinse solution with a wet vac. — — — —



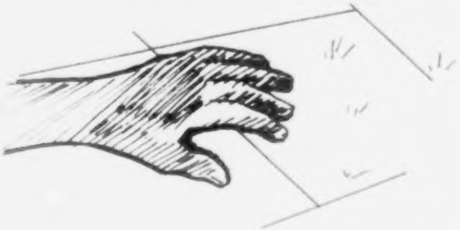
13. Repeat steps five through twelve on each 10 x 20 section of the floor until it has been stripped and rinsed.

14. Damp mop the floor twice with clean water and let it dry for at least an hour. — — — —

(Note: Be sure to change the rinse water frequently to insure all residue is removed. Stripper residue left on the floor will keep your polish or wax from bonding properly.)



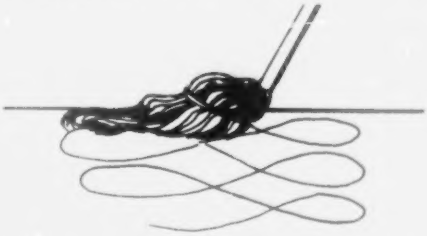
15. Inspect the floor to be sure all the old coatings and the stripping solution have been removed. A good test is to wipe your hand across the floor. If your hand is clean, so is the floor.



16. Have instructor inspect your work.

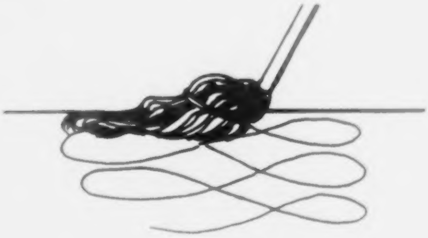
17. Pour floor finish into a clean mop bucket and dip a clean synthetic mop into the polish. Be sure the polish penetrates throughout the mop.

18. Wring out the mop to the point it's still well saturated, but not dripping, and begin applying the polish in a figure-8 motion.



19. Let the first coat dry 30 minutes and apply a second coat as described in step 18.

20. Let the second coat dry one hour and mop on the third coat just like before.



21. **Let the third and final coat of polish cure overnight. If additional coats are desired, wait at least overnight before applying.** ___ ___ ___ ___

22. Have instructor check your work. ___ ___ ___ ___

23. **As directed by instructor, prepare for next job sheet** or clean up area and return tools and materials. ___ ___ ___ ___

Average of above evaluations* ___ ___ ___ ___

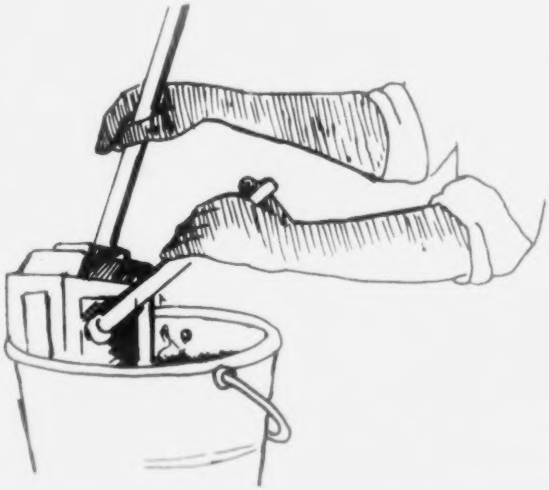
***This average is the student's evaluation for competency E-11 of Building Maintenance.**

CLEANING A WALL

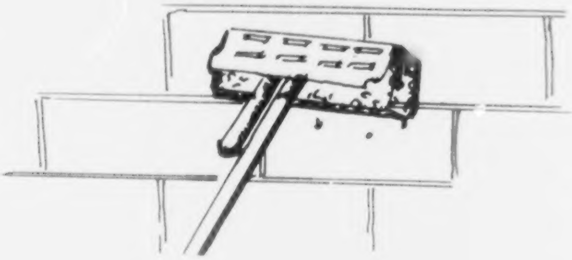
Equipment:

Flat mop or towels
Spray bottle
Cleaning chemicals
Eye protector

Procedure:	Evaluation 3	 2	 1	 N
Spray bottle procedure				
1. Wear eye protection.	__	__	__	__
2. Spray cleaner on wall and let stand for about 10 minutes.	__	__	__	__
3. Wipe cleaner off with towels.	__	__	__	__
4. Repeat steps 2 and 3 if necessary.	__	__	__	__
5. Have instructor check your work.	__	__	__	__
Flat mop procedure				
6. Put chemicals in wringer bucket.	__	__	__	__
7. Dip flat mop in bucket and squeeze out.	__	__	__	__



8. Wash down wall with flat mop. ___ ___ ___ ___



9. Have instructor check your work. ___ ___ ___ ___

10. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials. ___ ___ ___ ___

Average of above evaluations* ___ ___ ___ ___

***This average is the student's partial evaluation for competency E-12 of Building Maintenance.**

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT III: FINISHING PROCEDURES

LESSON I: GENERAL SAFETY

LESSON OBJECTIVE

After completion of this lesson, the student will be able to KNOW SAFE PROCEDURES FOR HANDLING FINISHES AND USING LADDERS. Mastery will be evidenced by completion of assignment sheet and by scoring ______________ percent on the lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Match terms associated with general safety to the correct definitions.
2. Match the seven colors of the safety color code to the correct applications of their use.
3. List rules for personal safety.
4. Select rules for general safety when handling finishes and related materials.
5. List safety rules for setting up ladders.
6. Match the classe of fire to the correct statement defining each class.
7. Label the three components of the fire triangle.
8. Match the type or types of fire extinguishers to the class of fire on which they are used.
9. Select steps to be followed in case of an emergency.
10. Select proper steps for lifting heavy objects.

Completion of the requirements of this lesson fulfills competency F-1 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT III: FINISHING PROCEDURES

LESSON 1: GENERAL SAFETY

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Transparency masters
  1. Ladder safety 1
  2. Ladder safety 2
  3. Ladder safety 3
  4. Ladder safety 4
  5. Ladder safety 5
  6. The fire triangle
  7. Types of fire extinguishers
  8. Lifting

D. Assignment sheet
  1. Steps to be followed in case of an accident

E. Lesson test

F. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT III: FINISHING PROCEDURES

LESSON 1: GENERAL SAFETY

INFORMATION OUTLINE

I. Terms and definitions

  A. Safety--state or condition of being safe; free from danger, risk or injury

  B. Accident--includes any suddenly occurring, unintentional event that causes injury or property damage

  C. First aid--immediate, temporary care given the victim of an accident or sudden illness until the services of a physician can be obtained

  D. O.S.H.A.--Occupational Safety and Health Act; federal legislation designed to insure safe and sanitary working conditions for employees

  (Note: Refer to your own state organization)

II. Colors and applications of the safety color code

  (Note: Refer to the National Safety Code)

  A. Federal safety red
    1. Location of fire fighting equipment
    2. Portable containers of flammable liquids
    3. Emergency stop bars, stop buttons, and emergency electrical stop switches on machinery

  B. Federal safety yellow
    1. Caution and for marking physical hazards
    2. Waste containers for explosive or combustible materials
    3. Caution against starting, using, or moving equipment under repair
    4. Identification of the starting point or power source of machinery

C. Federal safety orange
    1. Dangerous parts of machines
    2. Safety starter buttons and parts of equipment that may cause electrical shock
    3. Exposed parts (edges only) of pulleys, gears, rollers, cutting devices, and power jaws

D. Federal safety purple--Radiation hazards

E. Federal safety green
    1. Safety
    2. Location of first aid equipment

F. Federal safety black
    1. Traffic flow
    2. Housekeeping purposes

G. Federal safety white
    1. Traffic flow
    2. Housekeeping purposes

(Note: Black and white are used individually or in combination)

III. Rules for personal safety

A. Wear shop clothing appropriate to the instructional activity being performed

B. Confine long hair before operating rotating equipment

C. Always wear safety glasses

D. Remove ties when working around machine tools or rotating parts

E. Remove all metal jewelry when working

F. Conduct yourself in a manner conducive to safe practices

G. Use soap and water frequently to prevent skin irritation

IV. Rules for general safety when handling finishes and related materials

A. Allow adequate ventilation for type of finish

B. Use fire precautions when finishes or materials are flammable

C. Use a finish or related material only after determining its properties and its proper use

D. Properly close and store all unused materials

E. Properly dispose of all empty containers and used cleaning materials

V. Accidents and Safety

A. Report all accidents to the instructor regardless of nature or severity

B. Consider the safety of others when working in the shop

C. Report any condition that may lead to an accident

D. Watch the bulletin board for safety information and notices

E. Conduct yourself in a safe manner at all times

F. Do not throw any object

G. Control you temper; don't take chances

H. Wear gloves when handling material with sharp edges

I. Operate equipment and machines only when permitted by instructor

J. Do not distract the attention of a machine operator while working

K. Do only approved work in shop

L. Check all equipment before turning on switch

M. Do not work in the dark; use plenty of light

N. All accidents should be recorded in writing

O. All injuries must be given prompt attention

P. Do not work overtime in the shop without the instructor being present

VI. Housekeeping

A. Keep the shop or job site floor clear of scraps and litter

B. Clean up any spilled liquids immediately

C. Store oily shop towels or oily waste in metal containers

VII. Ladder safety (TM 1 - TM 5)

A. The legs of stepladders should be spread fully and the braces locked

B. Do not use the top platform of a stepladder for a step, and do not use the next step below the platform

C. All ladders should have a solid, level non-skid surface on which to stand

(Note: Non-slip, rubber caps on the base of ladder rails are good insurance)

D. The base of an extension ladder should be placed away from the wall a distance equal to about one-fourth its height

E. Do not climb above the third rung from the top of an extension ladder

F. Do not lean out too far--move the ladder.

G. If you are using a ladder to climb to a roof, make sure the ladder extends at least 3 feet above the edge of the roof

H. Do not lean the top of ladders against window panes or easily broken siding

I. Always face the ladder when going up or down

J. If a ladder must be placed in front of a door, lock the door

K. Do not use ladders that have cracks or broken parts

(CAUTION: Do not paint wooden ladders--the paint can hide dangerous defects--you can use a clear finish or stain)

L. To raise an extension ladder--place the bottom of the ladder against a wall--raise the other end and walk the ladder to a vertical position--then pull the bottom out the proper distance

M. Carry a ladder horizontally--balance the midpoint of the ladder on your shoulder

N. Do not use an aluminum ladder in any situation where you or the ladder might come in contact with electrical wiring

(CAUTION: Watch for overhead wires when carrying a metal ladder)

O. Before climbing a ladder check your shoe soles for oil, grease, mud or other slippery substances

VIII. Classes of fires

A. Class A--fires that occur in ordinary combustible materials

Examples: Wood, rags, and rubbish

B. Class B--fires that occur with flammable liquids

Examples: Gasoline, oil, grease, paints, and thinners

C. Class C--fires that occur in or near electrical equipment

Examples: Motors, switchboards, and electrical wiring

D. Class D--fires that occur with combustible metals

Examples: Magnesium

IX. Components of the fire triangle (TM 6)

A. Fuel--any combustible material

B. Heat--enough to raise the fuel to its ignition temperature

C. Oxygen--necessary to sustain combustion

(Note: These three elements must be present at the same time in order to produce fire--if any one of the three is missing, a fire cannot be started--with the removal of any one of them, the fire will be extinguished)

X. Types of fire extinguishers and classes of fires (TM 7)

A. Pressurized water--operates usually by squeezing a handle or trigger; used on Class A fires

B. Soda acid--operates by turning extinguisher upside down; used on Class A fires

C. Carbon dioxide (CO_2)--operates usually by squeezing handle or trigger--used on Class B and C fires

D. Dry chemical--operates usually by squeezing handle or trigger; used on Class B, C, and D fires

(Note: On Class D fires, dry sand is as effective as any dry chemical other than Purple X--the cost of the Purple X chemical places it out of reach of most shops)

E. Foam--operates by turning extinguisher upside down; use on Class A and B fires

XI. Steps to be followed in case of an accident in the shop

A. Report all accidents and injuries to the instructor no matter how minor they may seem

B. First aid will be administered if needed

(Note: Check with local school policy)

C. Student will be taken to school nurse

D. Student's parent or guardian will be notified if school nurse requires student to see a physician

E. Investigation of the accident will take place to determine the cause of the accident and ways to prevent the same accident from happening again

F. Accident report form will be filled out by instructor

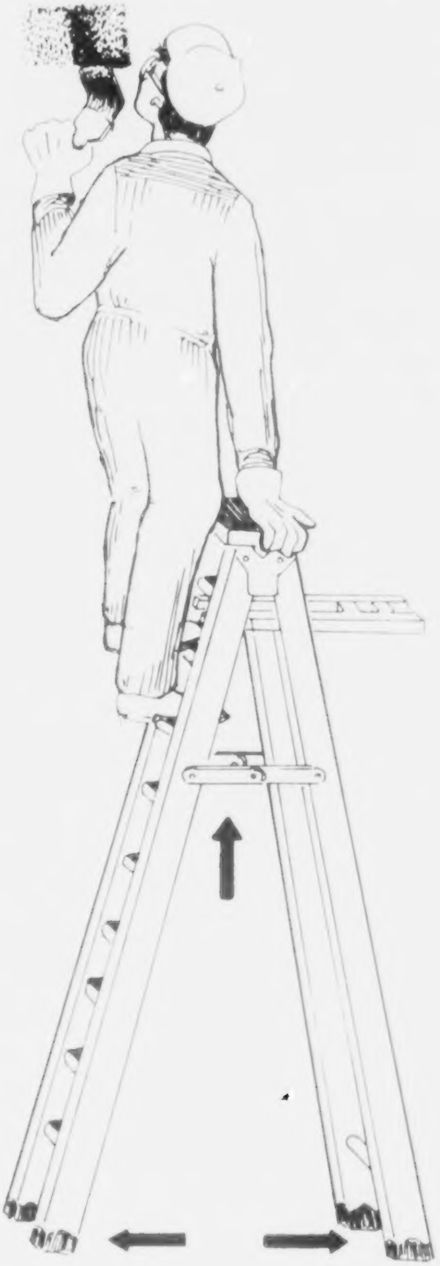
XII. Steps for lifting heavy objects (TM 8)

A. Bend knees

B. Keep back straight

C. Lift gradually with leg muscles

Ladder Safety 1

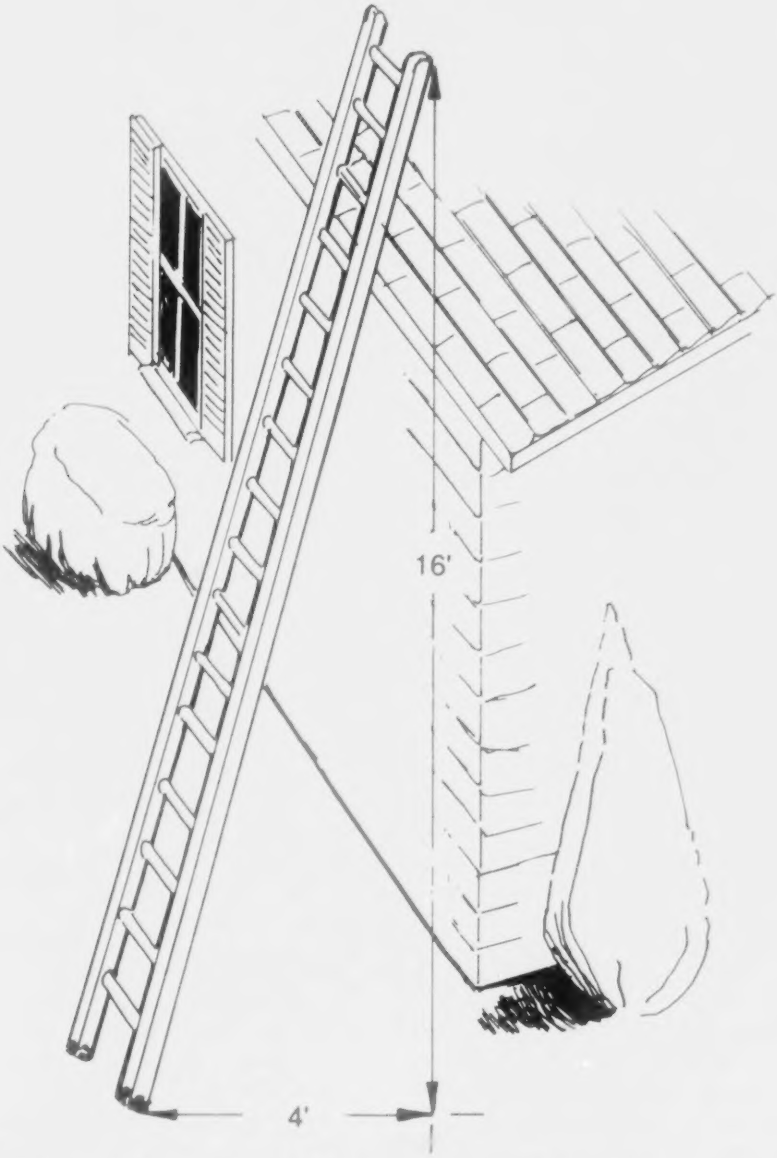


1. The legs of stepladders should be spread fully and the braces locked.

2. Do not use the top platform of a stepladder for a step or the next step below the platform.

3. All ladders should stand on a solid, level, nonskid surface and have rubber caps on the base of ladder rails.

Ladder Safety 2



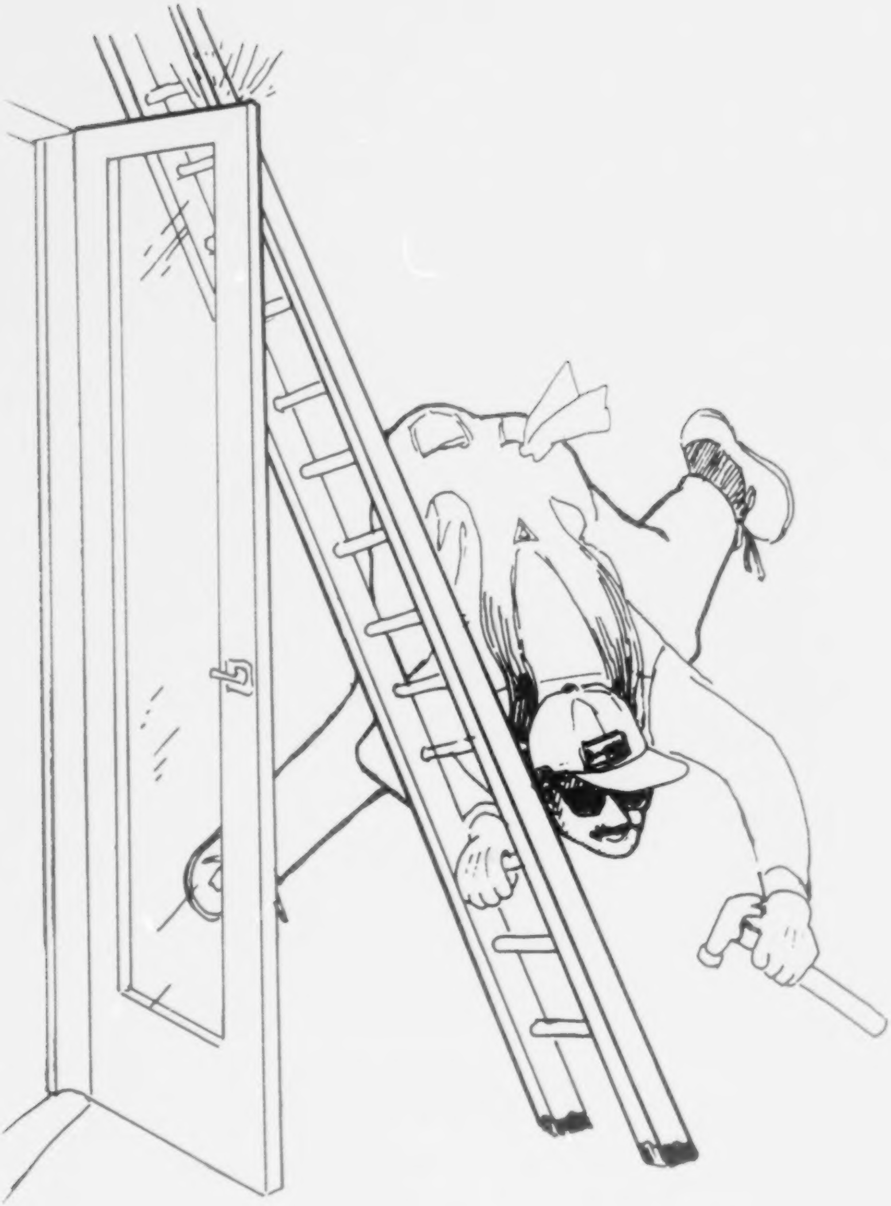
4. Place the base of an extension ladder away from the wall a distance equal about one-fourth its height.

5. Do not climb above the third rung from the top of an extension ladder.

6. Move the ladder, rather than leaning out too far.

7. If you are using a ladder to climb to a roof, make sure the ladder extends at least 3 feet above the edge of the roof.

Ladder Safety 3

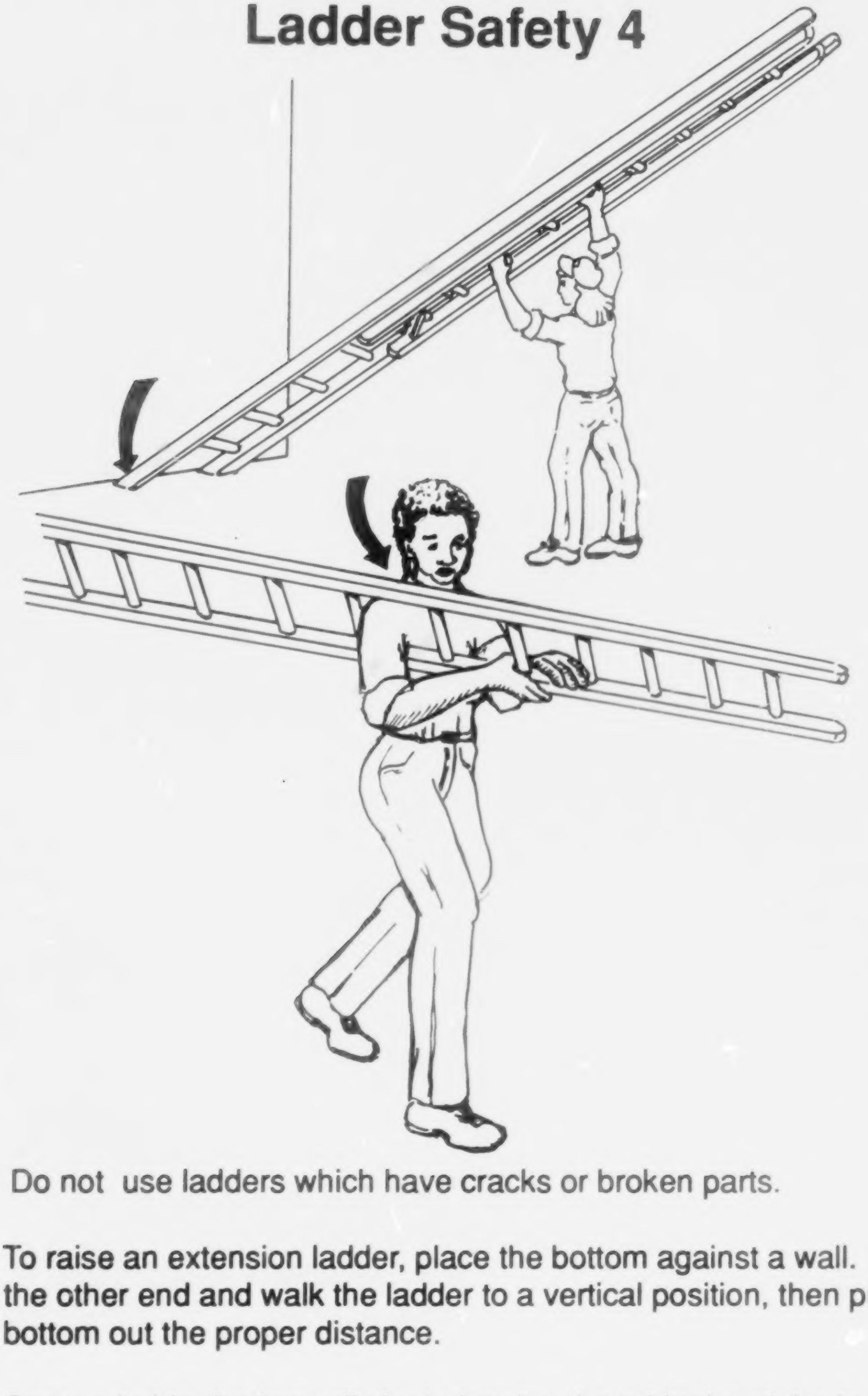


8. Don't lean ladders against window panes or easily broken siding.

9. Always face ladder when going up or down.

10. If a ladder must be placed in front of a door, lock the door.

Ladder Safety 4

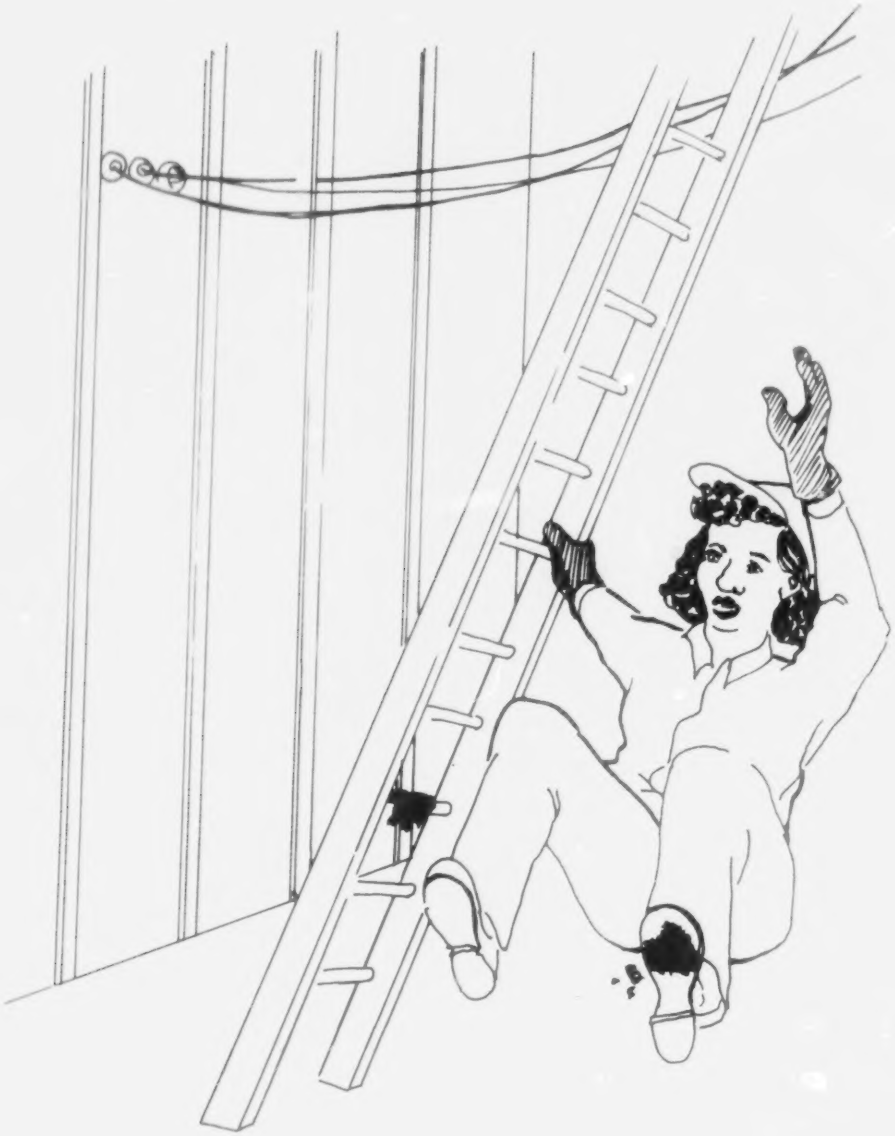


11. Do not use ladders which have cracks or broken parts.

12. To raise an extension ladder, place the bottom against a wall. Raise the other end and walk the ladder to a vertical position, then pull the bottom out the proper distance.

13. Carry a ladder horizontally by balancing the midpoint of the ladder on your shoulder.

Ladder Safety 5

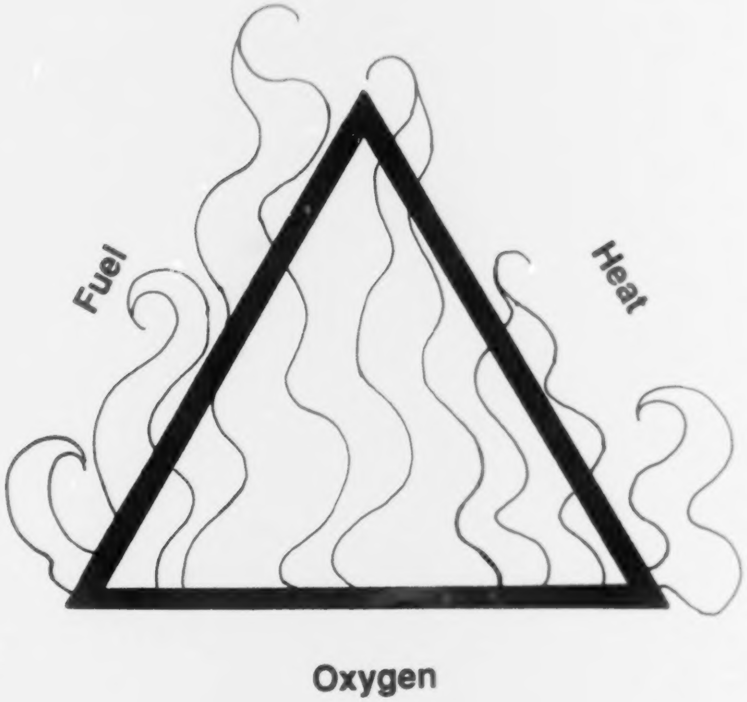


1. Do not use an aluminum ladder in any situation where you or the ladder might come in contact with electrical wiring.

2. Before climbing a ladder check your shoe soles for oil, grease, mud or other slippery substances.

The Fire Triangle

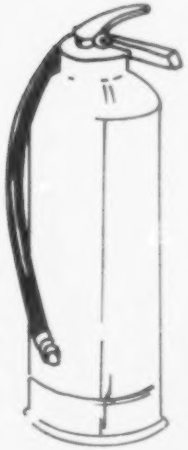
To produce fire, three things must be present at the same time.



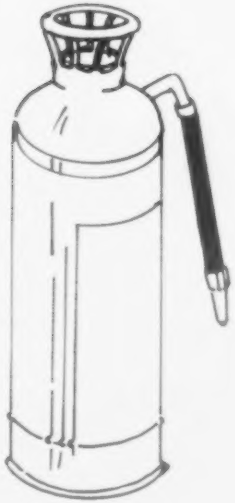
If any one of the three is missing, a fire cannot be started
or
with the removal of any one, the fire will be extinguished.

Types of Fire Extinguishers

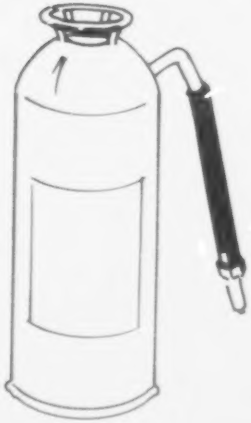
CFP 437



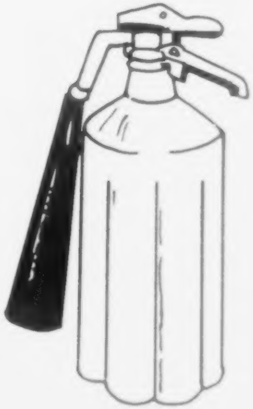
Pressurized Water
(Class A)



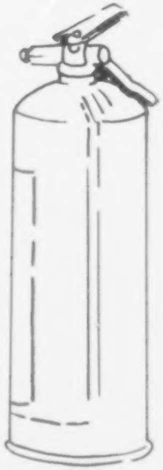
Soda-Acid
(Class A)



Foam
(Class A and B)



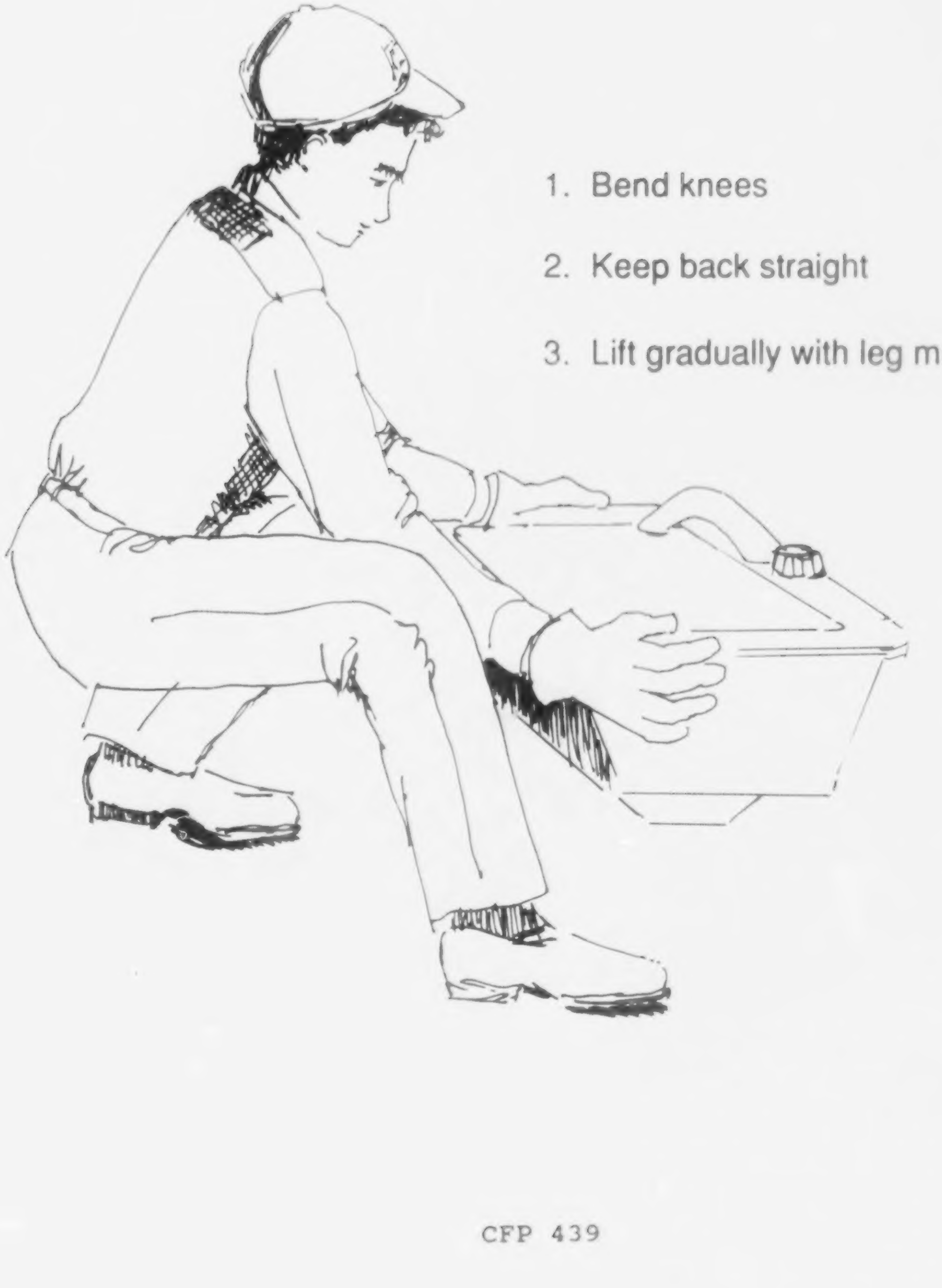
Carbon Dioxide
(Class B and C)



Dry Chemical
(Class B, C, and D)

TM 8

Lifting



1. Bend knees
2. Keep back straight
3. Lift gradually with leg muscles

DESCRIBE THE STEPS TO BE FOLLOWED IN CASE OF AN ACCIDENT

Given the accident below, discuss the steps to be followed and state the safety rule that would have prevented the accident.

A student is removing a sheet metal panel and cuts the palm of his or her hand to the bone.

ANSWERS TO ASSIGNMENT SHEET 1

Discussion should include:

1. Report all accidents and injuries to the instructor no matter how minor they may seem
2. First aid will be administered if needed

   (Note: Check with local school policy)
3. Student will be taken to school nurse
4. Student's parent or guardian will be notified if school nurse requires student to see a physician
5. Investigation of the accident will take place to determine the cause of the accident and ways to prevent the same accident from happening again
6. Accident report form will be filled out by instructor

The safety rule should be stated as follows:

Wear gloves when handling material with sharp edges

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT III: FINISHING PROCEDURES

LESSON 1: GENERAL SAFETY

LESSON TEST

Part 1. Match the terms below with the correct definition.

A. Safety
B. Accident
C. First Aid
D. O.S.H.A.

____ 1. Immediate, temporary care given the victim of an accident or sudden illness until the services of a physician can be obtained

____ 2. State or condition of being safe; free from danger, risk or injury

____ 3. Includes any suddenly occurring unintentional event that causes injury or property damage

____ 4. Occupational Safety and Health Act; federal legislation designed to insure safe and sanitary working conditions for employees

Part 2. Match the colors of the safety color code below to the correct application of their use. (May have more than one correct answer.)

A. Federal safety green
B. Federal safety white
C. Federal safety orange
D. Federal safety purple
E. Federal safety black
AB. Federal safety red
AC. Federal safety yellow

____ 5. Caution and for marking physical hazards

____ 6. Location of fire fighting equipment

____ 7. Location of first aid equipment

____ 8. Housekeeping purposes

____ 9. Traffic flow

____ 10. Radiation hazards

Part 3. Place a "T" in the blank beside each rule for general safety when handling finishes and related materials. Place an "F" in the blank beside statements that are not safety rules.

____ 11. Allow adequate ventilation

____ 12. Mix flammable materials near a gas water heater

____ 13. Properly close and store unused materials

____ 14. Pick up scrap and litter from the shop floor only once a day

____ 15. Let spilled liquids stay on floor until completely dry

____ 16. Report any condition that may lead to an accident

____ 17. Show your temper and take chances while working in the shop

____ 18. Wear gloves when handling material with sharp edges

Part 4. Match the classes of fires below to their correct statements.

A. Class A
B. Class B
C. Class C
D. Class D

____ 19. Fires that occur with flammable liquids

____ 20. Fires that occur in ordinary combustible materials

____ 21. Fires that occur in or near electrical equipment

____ 22. Fires that occur with combustible metals

Part 5. Match the types of fire extinguishers on the right to the class of fire on which they are used. (May be more than one answer on each line.)

A. Pressurized water
B. Carbon dioxide (CO_2)
C. Dry chemical
D. Soda acid
E. Foam

____ 23. Class B

____ 24. Class C

____ 25. Class A

____ 26. Class D

Part 6. Place a "T" beside each correct step to be followed in case of an accident. Place an "F" beside each incorrect statement.

____ 27. Investigation of the accident will take place to determine the cause of the accident and ways to prevent the same accident from happening again

____ 28. Apply a tourniquet

____ 29. Student's parent or guardian will be notified if school nurse requires student to see a physician

____ 30. Mouth-to-mouth resuscitation will be administered in all cases

____ 31. Student will be taken to the school nurse

____ 32. Student will be required to sign an insurance release form before he or she can be helped

____ 33. Report all accidents and injuries to the instructor no matter how minor they may seem

____ 34. First, mop up blood to prevent a slick spot on the floor

____ 35. Accident report form will be filled out by instructor

Part 7. Place a "T" on the blank beside each correct rule for lifting heavy objects. Place an "F" on the blank beside incorrect statements.

____ 36. Bend at the waist and lift straight up

____ 37. Keep back straight

____ 38. Straddle heavy objects before trying to lift

____ 39. Bend knees

____ 40. Lift in a quick jerking motion

____ 41. Lift gradually with leg muscles

Part 8. List five rules for personal safety.

42.

43.

44.

45.

46.

Part 9. List six rules for safely setting up and using a ladder.

47.

48.

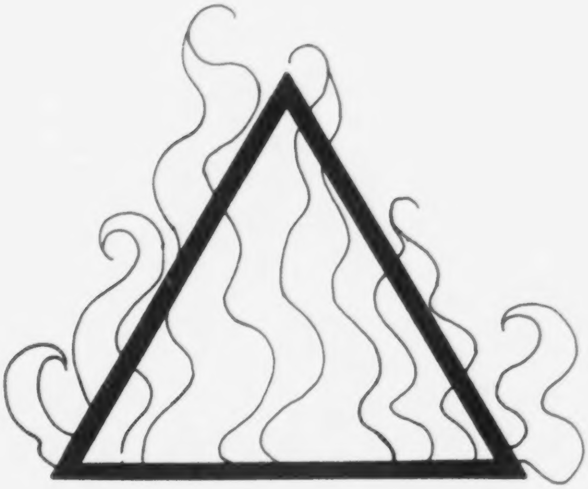
49.

50.

51.

52.

Part 10. Label the three components of the fire triangle.



MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT III, LESSON 1 TEST

Part 1.

1. C
2. A
3. B
4. D

Part 2.

5. AC
6. AB
7. A
8. C
9. B, E
10. D

Part 3.

11. T
12. F
13. T
14. F
15. F
16. T
17. F
18. T

Part 4.

19. B
20. A
21. C
22. D

Part 5.

23. B,C,E
24. B,C
25. A, D, E
26. C

Part 6.

27. T
28. F
29. T
30. F
31. T
32. F
33. T
34. F
35. T

Part 7.

36. F
37. T
38. F
39. T
40. B
41. T

Part 8. Any five of the following:

A. Wear shop clothing appropriate to the instructional activity being performed

B. Confine long hair before operating rotating equipment

C. Always wear safety glasses

D. Remove ties when working around machine tools or rotating parts

E. Remove all metal jewelry when working

F. Conduct yourself in a manner conducive to safe practices

G. Use soap and water frequently to prevent skin irritation

Part 9. Answer should include any six of the following:

A. The legs of stepladders should be spread fully and the braces locked

B. Do not use the top platform of a stepladder for a step--Do not use the next step below the platform

C. All ladders should have a solid, level non-skid surface on which to stand

(Note: Non-slip, rubber caps on the base of ladder rails are good insurance)

D. The base of an extension ladder should be placed away from the wall a distance equal to about one-fourth its height

E. Do not climb above the third rung from the top of an extension ladder

F. Do not lean out too far--move the ladder.

G. If you are using a ladder to climb to a roof, make sure the ladder extends at least 3 feet above the edge of the roof

H. Do not lean the top of ladders against window panes or easily broken siding

I. Always face the ladder when going up or down

J. If a ladder must be placed in front of a door--lock the door

K. Do not use ladders that have cracks or broken parts

(CAUTION: Do not paint wooden ladders--the paint can hide dangerous defects--you can use a clear finish or stain)

L. To raise an extension ladder, place the bottom of the ladder against a wall--raise the other end and walk the ladder to a vertical position--then pull the bottom out the proper distance

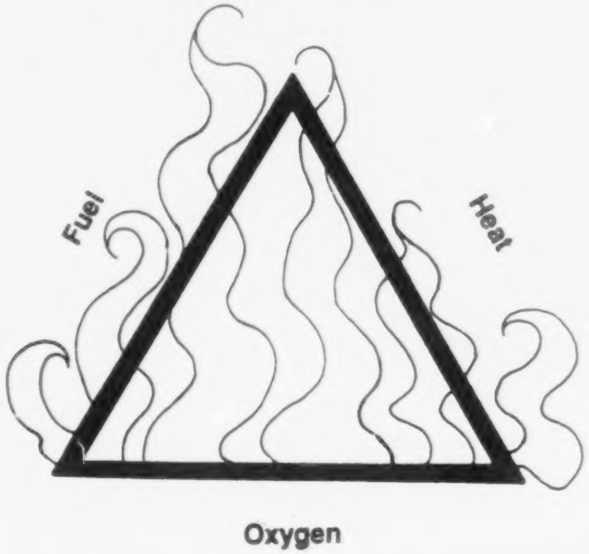
M. Carry a ladder horizontally--balance the midpoint of the ladder on your shoulder

N. Do not use an aluminum ladder in any situation where you or the ladder might come in contact with electrical wiring

(CAUTION: Watch for overhead wires when carrying a metal ladder)

O. Before climbing a ladder check your shoe soles for oil, grease, mud or other slippery substances

Part 10.



MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT III: FINISHING PROCEDURES

LESSON 2: PREPARE SURFACE FOR FINISH

LESSON OBJECTIVE

After completion of this lesson, the student will be able to SELECT PROPER TOOLS AND MATERIALS AND PREPARE A SURFACE FOR FINISHING. Mastery will be evidenced by completion of a job sheet and by scoring ___________ percent on lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. List six different tools or materials needed to prepare a surface for finishing.
2. Prepare a surface for finishing.

Completion of the requirements of this lesson fulfills competency F-2 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT III: FINISHING PROCEDURES

LESSON 2: PREPARE SURFACE FOR FINISH

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Job sheet
   1. Prepare surface for finishing

D. Lesson test

E. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

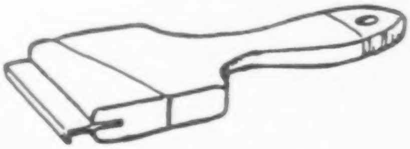
UNIT III: FINISHING PROCEDURES

LESSON 2: PREPARE SURFACE FOR FINISH

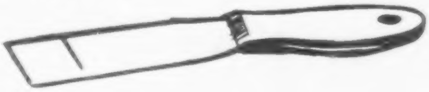
INFORMATION OUTLINE

I. Tools and equipment needed

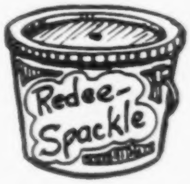
A. Paint scraper--tool used to remove old peeling or cracked paint



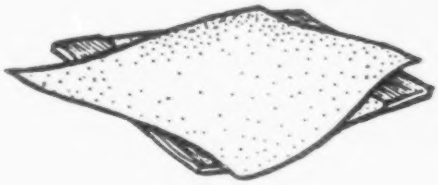
B. Putty knife--tool used to spread spackling material on holes and cracks



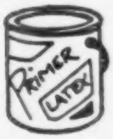
C. Spackling compound--material used to patch holes or cracks in a wall



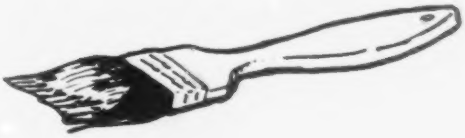
D. Sandpaper--abrasive used to smooth walls before painting



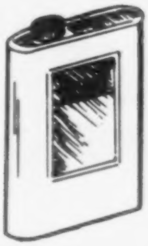
E. Primer--paint used to cover bare or patched areas and new walls



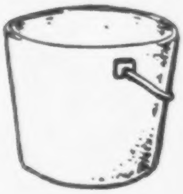
F. Trim brush--small paint brush used in small or tight areas



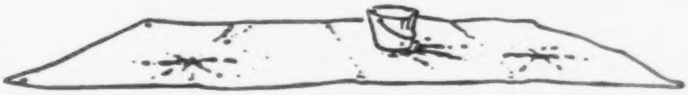
G. Solvent--material used to clean brushes and other painting equipment



H. Paint pail--container to hold paint while working



I. Drop cloth--protective cloth used when painting



JS 1

PREPARING A SURFACE FOR FINISHING

Equipment:

Paint scraper
Putty knife
Spackling compound
Sandpaper
Primer
Trim brush
Solvent
Paint pail
Drop cloth
Safety glasses

Procedure:		Evaluation 3	2	1	N
1.	Wear safety glasses.	___	___	___	___
2.	Use the paint scraper to scrape away any rough, cracked or peeling paint.	___	___	___	___
3.	Find small holes and fine cracks in the wall. Scoop up a small amount of spackling compound with putty knife.	___	___	___	___
4.	Press the spackling compound into the hole with the flat side of the putty knife.	___	___	___	___
5.	Smooth the compound with tip of putty knife.	___	___	___	___
6.	Leave a small mound of compound over holes and cracks.	___	___	___	___
7.	When the patches are dry, sand them smooth and level with the rest of wall.	___	___	___	___
8.	Lightly sand the rest of the wall.	___	___	___	___
9.	Wash the entire wall. Use warm, soapy water and sponge.	___	___	___	___
10.	Scrub areas that have dirt or grease spots.	___	___	___	___
11.	Rinse the wall with clean water and damp sponge.	___	___	___	___
12.	Open a can of pre-mixed latex primer and stir the primer for several minutes with a wooden paddle.	___	___	___	___
13.	Pour a small amount of primer into a paint pail. Close lid on primer can.	___	___	___	___
14.	Dip the paint brush into the primer. No more than one-half of the brush bristles should be in the primer. Dip brush three or four times.	___	___	___	___

15. Lift brush straight up out of the primer. Gently tap both sides of brush against inside of pail. ____ ____ ____ ____

16. Using smooth brush strokes, paint the patched areas. Also paint areas that have been scraped or sanded bare. ____ ____ ____ ____

17. Wipe up any drips or spills with a damp cloth. ____ ____ ____ ____

18. Clean the brush. ____ ____ ____ ____

19. Have instructor check your work. ____ ____ ____ ____

20. Clean all other equipment. ____ ____ ____ ____

21. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials. ____ ____ ____ ____

Average of above evaluations* ____ ____ ____ ____

***This average is the student's partial evaluation for competency F-2 of Building Maintenance.**

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT III: FINISHING PROCEDURES

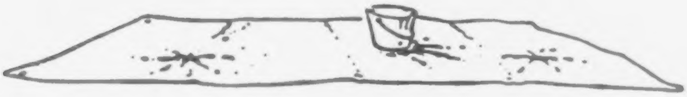
LESSON 2: PREPARE SURFACE FOR FINISH

LESSON TEST

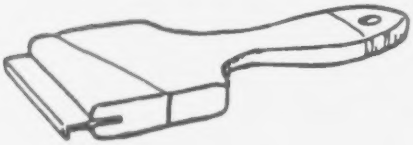
Part 1. Match the terms below with the correct illustration and definition.

A.	Trim brush	D.	Spackling compound
B.	Latex primer	E.	Drop cloth
C.	Paint scraper	AB.	Sandpaper

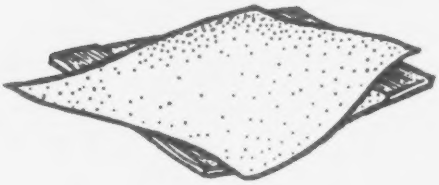
_______ 1. Protective cloth used when painting



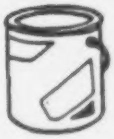
_______ 2. Tool used to remove old peeling or cracked paint



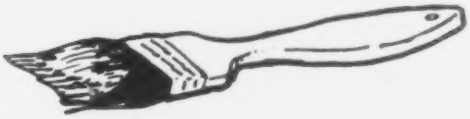
_______ 3. Abrasive used to smooth walls before painting



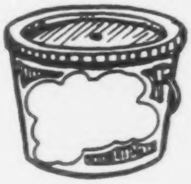
_______ 4. Paint used to cover bare or patched areas, and new walls



_______ 5. Small paint brush used in small or tight areas



_______ 6. Material used to patch holes or cracks in a wall



MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT III, LESSON 2 TEST

Part 1.

1. E
2. C
3. AB
4. B
5. A
6. D

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT III: FINISHING PROCEDURES

LESSON 3: SELECT CORRECT FINISHING MATERIALS

LESSON OBJECTIVE

After completion of this lesson, the student will be able to CHOOSE THE CORRECT PROTECTIVE COATING FOR PARTICULAR SURFACE-FINISHING TASKS. Mastery will be evidenced by scoring __________ percent on the lesson test.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Identify terms and definitions associated with protective coatings.
2. Match types of finishing paint with their appropriate characteristics.
3. List types of stains and clear finishes.
4. Name primers, preservatives and sealers and identify their special qualities.

Completion of the requirements of this lesson fulfills competency F-3 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT III: FINISHING PROCEDURES

LESSON 3: SELECT CORRECT FINISHING MATERIALS

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Lesson test

D. Answers to lesson test

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT III: FINISHING PROCEDURES

LESSON 3: SELECT CORRECT FINISHING MATERIALS

INFORMATION OUTLINE

I. Terms and definitions

   A. Latex flat--most popular choice for most exterior siding surfaces because it is thinned and cleaned with water

   B. Alkyd flat--exterior paint; adheres and covers all surfaces well except unprimed masonry or metal

   C. Oil flat--oil-base flat paint that dries slowly and has been outmoded by modern latexes and alkyds

   D. Glossy trim--great resistance to wear and washing makes this best for windows, doors and shutters

   E. Marine paints--excellent wearing qualities make them popular for outdoor wood or metal house trim

   F. Porch and floor paint--withstands bad weather and traffic on porches and outside steps

   G. Shingle paint--used on asbestos or wood siding shingles

   H. Metal paint--stops rust to some degree

   I. Masonry paint--a type of paint meant for interior masonry; also used outside the house

   J. Stains--used on wood siding and shingles

   K. Varnish--used almost exclusively on wood to protect it from weathering and allows the wood to retain its natural appearance and color

   L. Primers--used under exterior paints; are extremely flexible to adjust to wall expansion and contraction

   M. Wood preservative--protects wood from weather; also protects against insect and fungus damage

N. Block filler--can be used to seal and smooth masonry surfaces; also a coating

O. Silicone water repellent--reduces minimum water seepage through exterior wood surfaces

II. Types of primers, preservatives, sealers

A. Primers
  1. Extremely flexible
  2. A special type for galvanized steel

B. Wood preservatives
  1. Protects against insects and fungi
  2. Used only on bare wood

C. Block filler
  1. A masonry sealer
  2. An undercoat for paint

D. Silicone water repellent
  1. A barrier to all other coatings
  2. Preserves appearance of wood

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT III: FINISHING PROCEDURES

LESSON 3: SELECT CORRECT FINISHING MATERIALS

LESSON TEST

Part 1. Match the following protective coating terms with their proper definitions.

A. Glossy trim
B. Marine paint
C. Latex flat
D. Metal paint
E. Porch/floor paint
AB. Masonry paint
AC. Silicone water repellent
AD. Oil flat
AE. Stains
BC. Alkyd flat
BD. Varnish
BE. Shingle paint
CD. Primers
CE. Block filler
DE. Wood preservative

________ 1. Most popular choice for most exterior siding surfaces because it is thinned and cleaned with water

________ 2. Exterior paint; adheres and covers all surfaces well, except unprimed masonry or metal

________ 3. Oil-base flat paint that dries slowly and has been outmoded by modern latexes and alkyds

________ 4. Great resistance to wear and washing makes this best for windows, doors and shutters

________ 5. Excellent wearing qualities make them popular for outdoor wood or metal house trim

________ 6. Withstands bad weather and traffic on porches and outside steps

________ 7. Used on asbestos or wood siding shingles

________ 8. Stops rust to some degree

________ 9. A type of paint meant for interior masonry; also used outside the house

________ 10. Used on wood siding and shingles

_________ 11. Used almost exclusively on wood to protect it from weathering and allows the wood to retain its natural appearance and color

_________ 12. Used under exterior paints; are extremely flexible to adjust to wall expansion and contraction

_________ 13. Protects wood from weather; also protects against insect and fungus damage

_________ 14. Can be used to seal and smooth masonry surfaces; also a coating

_________ 15. Reduces minimum water seepage through exterior wood surfaces

MODULE: CARPENTRY AND FINISHING PROCEDURES

ANSWERS TO UNIT III, LESSON 3 TEST

Part 1.

1. C
2. BC
3. AD
4. A
5. B
6. E
7. BE
8. D
9. AB
10. AE
11. BD
12. CD
13. DE
14. CE
15. AC

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT III: FINISHING PROCEDURES

LESSON 4: PREPARE, APPLY AND STORE FINISHING MATERIALS

LESSON OBJECTIVE

After completion of this lesson, the student will be able to PREPARE, APPLY AND STORE FINISHING MATERIALS AND EQUIPMENT. Mastery will be evidenced by completion of job sheets.

SPECIFIC OBJECTIVES

In completing this lesson, the student will:

1. Demonstrate the ability to stir or shake paint.
2. Demonstrate the ability to select a brush and apply finish.
3. Demonstrate the ability to select a roller, roller cover, paint pan and apply finish.
4. Demonstrate the ability to prepare a paint sprayer and apply finish.
5. Demonstrate the ability to select the proper cleaning solvent and clean a brush, roller, paint pan and paint sprayer.

Completion of the requirements of this lesson fulfills competencies F-4, F-5, F-6, F-7 and F-8 of Building Maintenance.

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT III: FINISHING PROCEDURES

LESSON 4: PREPARE, APPLY AND STORE FINISHING MATERIALS

CONTENTS OF LESSON

A. Objectives

B. Information outline

C. Job sheets
    1. Apply finish with brush and roller
    2. Apply finish with a paint sprayer
    3. Clean and store brushes, rollers and paint sprayer

MODULE: CARPENTRY AND FINISHING PROCEDURES

UNIT III: FINISHING PROCEDURES

LESSON 4: PREPARE, APPLY AND STORE FINISHING MATERIALS

INFORMATION OUTLINE

I. Preparing an area for finish application

   A. Move finish and finishing materials into a properly prepared area

   B. Move furniture as necessary and place drop cloths on floor when performing interior finishing

   C. Place finish and finishing equipment on a drop cloth

   D. If you need a ladder, select an appropriate one and set it up safely as demonstrated in Lesson 1

   (Note: In this lesson we will use an interior wall)

II. Stir or shake finish

   A. Electric shaker
      1. When you use an electric shaker, be sure that the container lid is closed securely and that the can is secure in the shaker

      2. Turn shaker on and allow to operate until paint is thoroughly mixed

   B. Hand stirring
      1. Stir with stirring stick until finish is completely smooth and thoroughly mixed

III. Apply finish with a brush

   A. Pour mixed finish into a pail

   B. Dip lower half of paint brush bristles in paint several times--gently tap both sides of the brush against the inside of paint pail

   C. Beginning in the corner, start painting a narrow strip around edges of the wall--make brush strokes in same direction and on wooden surfaces paint with the grain of the wood

D. Paint a strip completely around the wall section

E. Wipe up any drips or spills

IV. Apply finish with roller and pan

A. Stir paint again and pour some into the roller tray --pour paint about half way up sloping bottom of the tray

B. Roll paint roller into and out of paint two or three times

C. To avoid drips, lightly roll roller back and forth on ridged part of the tray

D. Begin painting across the top of the wall

E. Keeping the roller in contact with the wall, roll in different directions

F. Smooth and blend paint with horizontal strokes

G. Paint in strips across the wall--work your way down the wall until it is completed

H. A second coat may be needed

(Note: Check paint can label--see how long paint should dry before another coat can be applied--apply second coat using the same procedure)

I. Wipe drips and spills from floor, woodwork and equipment

V. Apply finish with sprayer

A. Finishing materials and clean surfaces should be sprayed at room temperatures of more than 70 degrees --finishes work best in a specified consistency, called viscosity--a cupful of properly thinned material should flow from a spray gun in a designated number of seconds for best results, according to the manufacturer's specifications

B. Strain finishes into the container through cheesecloth or or fine window screen if there is any possibility of particles in the liquid--these particles clog a gun and they are often found in cans of finish that have been opened for previous use

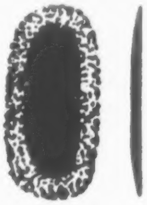
C. Attach the cup to the gun

D. Start the compressor and let the air pressure increase. Open the air line to the regulator. Check the regulator to see that the pressure is somewhat greater than that needed at the gun. There will be an air loss that must be adjusted. The longer the air hose and the smaller the inside diameter, the greater the loss of pressure, regardless of the volume of compressed air generated by the system. The regulator must allow sufficient passage of air.

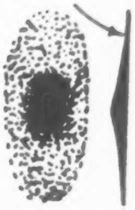
E. Adjust the regulator on the gun air hose line for the pressure needed

F. Regulate the fluid adjustment screw on the rear of the gun. The fluid adjustment screw controls the amount of finishing material that leaves the gun.

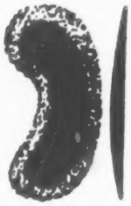
G. Adjust the air cap to the proper externally mixed spray pattern. This could be either a spot or an elongated (elliptical) pattern.



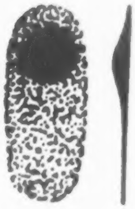
Correct
Fan Pattern



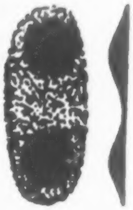
Heavy
Center



Peanut

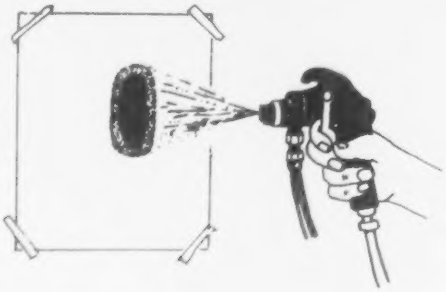


Heavy
End

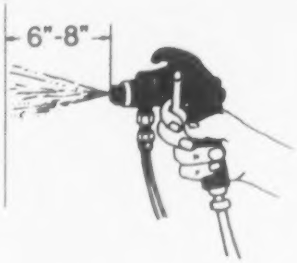


Split
Spray

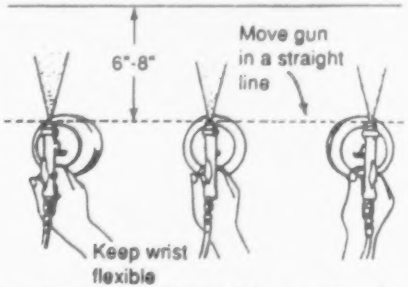
H. Test on scrap paper and perform steps E, F, and G until the proper spray is obtained.



I. Hold the spray gun 6 to 8 inches from the surface to be sprayed.

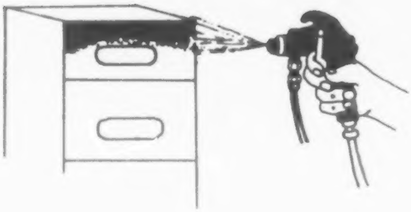


Pull the trigger and make the spray stroke a continuous movement parallel to the surface.

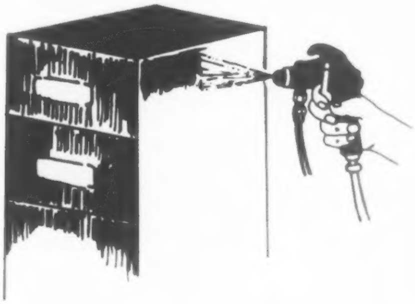


Runs and sags result when the gun is held too close, is moved too slowly or is delivering too much fluid for the operator to control. When the spray gun nozzle is held too far from the surface, the material atomizes and too much mist is lost. This causes waste and leaves a cloudy, sandy finish that must be done over. A deliberate, steady pass that leaves a full, wet coat is desired. Arching and tilting the gun are the two common faults that produce a streaky effect.

J. Corners of projects should be sprayed first.

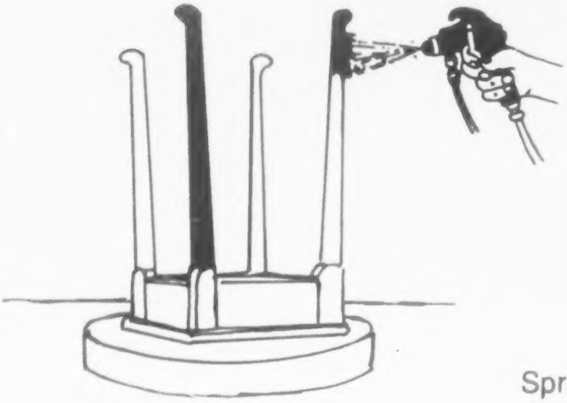


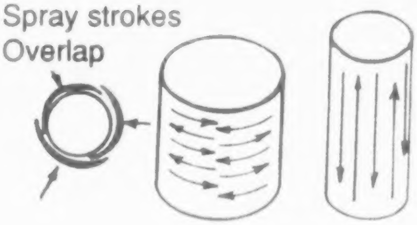
K. Turn the project so that the gun is always perpendicular to the surface being sprayed. Tilting allows finish to spill from the air vent and eventually will close it. This stopping up prevents operation until the opening is clear.



L. Move the gun to the corner of the project to be sprayed. As it reaches the leading corner or edge, pull the trigger and release it near the end. Pull it for the next stroke and release it at the end. This will prevent fatigue and overspraying. Leave flat surfaces to be done last.

M. Use a round spray pattern for table legs and similar round surfaces. When spraying curved surfaces, hold the gun the same way and at the same distance from the work. Follow the curvature of the surface.





N. Study each project or object before spraying it. Decide what procedure will be the simplest, easiest, and require the fewest passes of the gun. Use a round spray pattern on a narrow object or piece; a wide (elliptical) on larger surfaces.

VI. Clean and store finishing equipment and materials

A. Pour all untainted, unused finish back into finish containers. Fasten lids securely and return to finish storage area. Wash paint pails and pans with proper thinning solvent for paint and allow to dry.

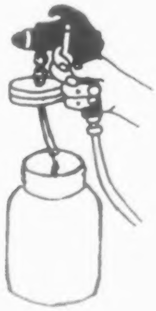
B. Clean and store brushes
  1. Remove excess finish by drawing the flat side of the brush across the lip of the can.
  2. Clean brushes immediately after use.

3. Wash completely in the proper solvent. This is usually the thinner for the finishing material used. Wash shellac brushes in alcohol; lacquer brushes in lacquer thinner; varnish, oil paint, and enamel brushes in turpentine, and water-thinned paintbrushes in water.
4. Squeeze out excess solvent.
5. After the brush is clean, wash it with mild soap or detergent and warm water.
6. Remove excess water and wrap the brush in clean paper to reshape the bristles as they dry. After drying, wrap the ferrule and bristles in heavy paper and band loosely with rubber band.
7. Never stand brush on its bristles. Always hang brush by its handle or lay it flat.

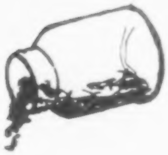
C. Clean and store rollers
1. Clean rollers immediately after use.
2. Rinse roller in proper solvent (as for B3 above)
3. Separate roller and roller cover and wash in proper solvent.
4. Squeeze out excess solvent from roller cover being careful not to crush cover.
5. Dry roller with clean cloth or paper towels.
6. Roll cover in paper towels to remove excess solvent.
7. Remove cover from paper towels and replace on roller and hang on hook in storage area.

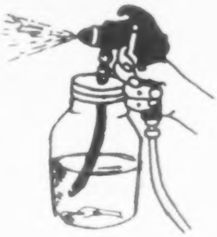
D. Clean and store paint sprayer--the spray gun is a precision tool. It should be carefully handled and maintained. The fluid needle packing, the air-valve stem, and the trigger-bearing screw should have a drop of oil on them daily when the gun is in use. Clean the gun as follows:

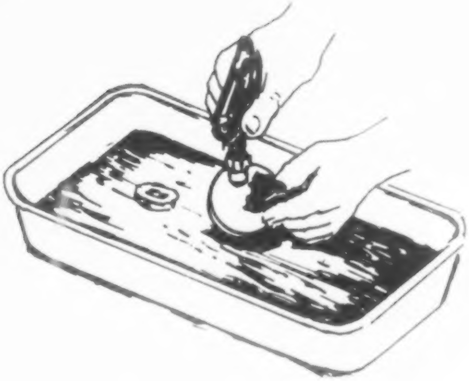
1. Loosen the air cap slightly and remove the cup.
2. Pull the gun trigger and release any material in the gun so that it flows back in the cup.



3. Empty the cup and clean it thoroughly.
4. Put about a cup of the correct thinner into the container. Spray the thinner to clear out the passageways.
5. Remove the cap and tip. Clean them in the proper thinner.







6. Close the air line to the regulators. Bleed off all pressure on the valves and hose. Release the pressure on the regulator screws. These should read zero (0) pressure.
7. Return paint sprayer to storage area.

JS 1

APPLY FINISH WITH BRUSH AND ROLLER

Equipment:

Safety glasses
Finish
Brush
Drop cloths
Pail
Roller tray
Ladder (if required)
Roller and roller cover
Thinning solvent (as required by finish)

Procedure:	Evaluation 3	2	1	N
1. Stir or shake finish.				
2. Pour finish into pail.				
3. Dip lower half of brush into paint several times. Tap both sides of the brush against inside of paint pail.				
4. Paint a narrow strip around edges of wall.				
5. Wipe up drips or spills.				
6. Stir paint again and pour paint into roller tray.				
7. Roll paint roller into and out of paint.				
8. Roll roller lightly on ridged part of tray.				
9. Paint across top of wall.				
10. Keeping roller in contact with wall, roll in different directions.				
11. Smooth and blend paint with horizontal strokes.				
12. Paint in strips across the wall. Work your way down until wall is completed.				
13. Have instructor check your work.				
14. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials.				

Average of the above evaluations* ____

***This average is the student's evaluation for competencies F-4, F-5 and F-6.**

JS 2

APPLY FINISH WITH A PAINT SPRAYER

Equipment:

Safety glasses and mask
Masking materials (if required)
Thinning solvent (as required by finish)
Drop cloth
Paint sprayer
Finish

Procedure:

		Evaluation			
		3	2	1	N
1.	Mask needed areas and place drop cloth.				
2.	Stir or shake paint.				
3.	Thin finish to proper viscosity.				
4.	Strain finish into container to remove any particles.				
5.	Fill cup and attach to gun.				
6.	Start compressor. Allow pressure to build and open air line.				
7.	Adjust regulator for needed pressure.				
8.	Regulate fluid adjustment screw.				
9.	Adjust air cap for proper spray pattern.				
10.	Test spray and pattern.				
11.	Hold gun 6 to 8 inches from surface to be sprayed, pull trigger and make spray stroke.				
12.	Spray corners of item first. Always keep the gun perpendicular.				
13.	Move gun across item to be sprayed in continuous strokes until item is finished.				
14.	Have instructor check your work.				
15.	As directed by instructor, prepare for next job sheet or clean up area and return tools and materials.				
	Average of above evaluations*				

***This average is the student's evaluation for competency F-7 of Building Maintenance.**

JS 3

CLEAN AND STORE BRUSHES, ROLLERS AND PAINT SPRAYER

Equipment:

Safety glasses
Roller and roller cover
Clean rags
Thinning solvent (as required by finish)
Brush
Paper towels
Paint sprayer
Soap and water

Procedure:	Evaluation			
	3	2	1	N
1. Remove excess finish from brush.				
2. Wash in proper solvent.				
3. Squeeze out excess solvent.				
4. Wash brush in mild soap and water.				
5. Remove excess water and wrap brush in clean paper towel. Allow to dry.				
6. Wrap brush ferrule and bristles in paper and band loosely with a rubber band.				
7. Hang brush or lay flat.				
8. Rinse roller in proper solvent.				
9. Separate roller from cover and wash in proper solvent.				
10. Squeeze out excess solvent.				
11. Dry roller with clean rag or paper towel.				
12. Roll cover in paper towel.				
13. Replace roller cover on roller and hang in storage area.				
14. Loosen air cap on paint sprayer and remove cup.				
15. Pull gun trigger and release any finish to flow back into cup.				

16. Empty cup and clean it thoroughly in proper solvent. ____ ____ ____ ____

17. Put a cup of solvent in cup and spray through gun to clean passageways. ____ ____ ____ ____

18. Remove cap and tip and clean in proper solvent. ____ ____ ____ ____

19. Close air line to regulators. ____ ____ ____ ____

20. Bleed off pressure. ____ ____ ____ ____

21. Store paint sprayer. ____ ____ ____ ____

22. Have instructor check your work. ____ ____ ____ ____

23. As directed by instructor, prepare for next job sheet or clean up area and return tools and materials. ____ ____ ____ ____

Average of above evaluations* ____ ____ ____ ____

*This average is the student's evaluation for competency F-8 of Building Maintenance.